

THE IRON AGE

August 11, 1932

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THE IRON AGE PUBLISHING COMPANY, 239 WEST 39th ST., NEW YORK

Division of United Business Publishers, Inc.

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Member, Audit Bureau of Circulations

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Published every Thursday. Subscription Price:
United States and Possessions, Mexico, Cuba, \$6.00;
Canada, \$8.50, including duty; Foreign, \$12.00 a
year. Single Copy 25 Cents

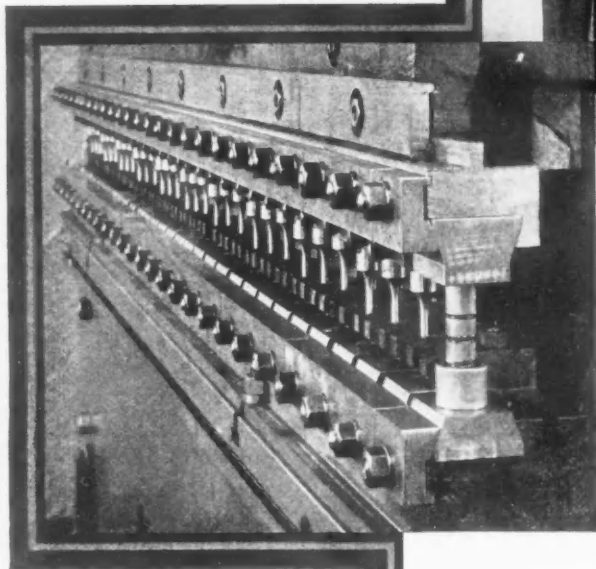
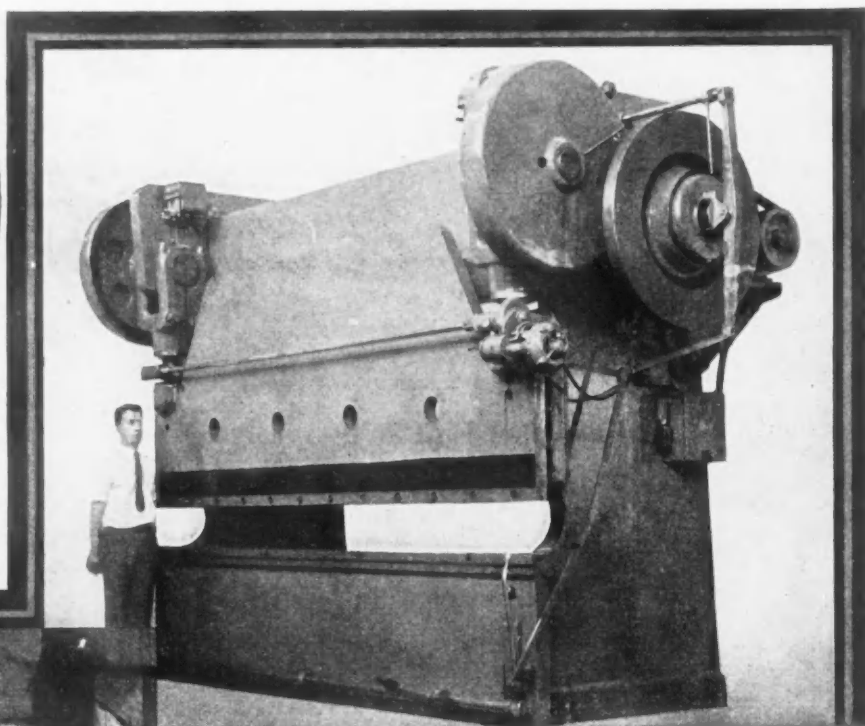
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THE IRON AGE

NEW YORK, AUGUST 11, 1932

ESTABLISHED 1855

Vol. 130, No. 6

Burning Fuel Oil At a Profit

SUBSTANTIALLY every phase of industrial oil burning is considered in detail in this and following articles in a series, which will appear in four related instalments. Without doubt it will prove to be the most important contribution which has been made to the subject in a long time.

Oil storage and handling systems are covered in the first part; mechanical treatment of sludge-carrying oil and the burner question will be taken up in the second part; furnace performance will occupy the third part, and calculating the size and fuel requirements of furnaces and selecting the operator will complete the series. For specific discussion the principles will be explained in an application to a forging shop.

The suggestions offered are the outgrowth of actual work and experience in improving oil-burning plants. The company with which the author is identified specializes in oil-burning equipment.

No industrial plant, says the author, can be said to be up to date which is limited to the use of high cost fuel. The truly modern oil-burning plant is the one which will successfully use any grade of oil, tar or asphalt on the market.



THERE are three prime factors in making the most out of fuel oil for industrial heating. They are the equipment, method of operation and the grade of fuel. Any plant of the right design and operated intelligently will provide for a range in fuel specifications to meet any demand for a good work and a degree of economy that will match any condition of competition. Many times the purchasing department and even the management have planned for a cheaper fuel, only to be told and later to have it proved to them that it was out of the question. The fact can usually be traced to faulty design of the system and equipment which could only operate with high gravity, low viscosity oil, the kind which costs the most, but yields the least amount of heat per gallon. No industrial plant can be said to be up to date which is limited to the use of high cost fuel, no matter what it may be like otherwise.

Fuel oil came to be used in industry long before the automobile established

By ROBERT C. HOPKINS
Alliance Brass & Bronze Co.,
Alliance, Ohio

the demand for vast quantities of gasoline and it naturally contained a relatively high percentage of gas. This made the handling a very ordinary problem of storage and pumping. The light oil was easily broken into a fine spray or atomized and with low air or steam pressure.

Oil was stored in any convenient way, often exposed to all the prevailing temperatures and with no provision for heating or retaining the heat. Any available style and design of pump supplied the oil flow and often through a dead end line, either directly exposed to the air or in cold, damp earth in the case of underground lines.

Burners were of such design and variety as the ingenuity of plant me-

chanics could supply or that were purchased from the best salesman who came to the rescue. Competition was not keen enough to reckon with fuel and its cost and there were no unusual demands in the nature of close control of either furnace conditions or combustion efficiency. Like all processes, it was a development, but the time came when the fuel market changed and many plants became obsolete in relation to the new grades of fuel. Often-times when the equipment failed with heavy oil, the fuel was thereupon condemned as worse than useless, appearing positively injurious and destructive to operating schedules.

At this point, engineers were attracted and the result was to discover that the heating problem was in no sense inferior but of prime importance.

For the purpose of a somewhat specific discussion and a working basis, this paper will deal with the equipment for a drop forge plant and

its related heat-treat and draw furnaces in common use. Correct heating is an absolute necessity in the production of good quality forgings and another item is the cost in meeting the highly competitive market. There is but one answer and that is: get the most out of the fuel and keep an eye on the product, both quality and tonnage. The upkeep cost of dies, hammers and presses is always high enough with the best heating operation and it is far greater when working steel below forging temperature or with steel burned on the outside and cold within, and neither is there quality nor economy in forcing a furnace beyond the natural rate of heat absorption of the bars or forging billets.

It is both good planning and practice to lay out the plant for a certain number of units and when this is outgrown by production demands, to lay out another system which can be operated separately or cross connected for distributive plant operation when lower production volumes require it. An overloaded single system is not economical and neither is it good practice to operate far below capacity as in the case of a single system built for the maximum demands of business or abnormal level.

Each independent system can be very convenient, when designed for a maximum fuel consumption of 600 gal. an hour. An up-to-date oil burning plant is the one which will successfully use any grade of oil, tar or asphalt on the market. It is not only possible to do this but it is actually

done and with results which fully justify the investment. There is wisdom in providing every aid for the best, low cost available fuel. Heavy high viscosity fuels are no longer a novelty and the limit has not been reached.

Equipment Required for Storage of Fuel

STORAGE capacity should be sufficient to insure steady, uninterrupted plant operation and will depend on shipping facilities and distance from source of supply. For a daily consumption of 1000 gal., two 10,000-gal. horizontal tanks will usually fulfill all requirements for plants located on or near railroad trunk lines. Two or more storage units make it convenient for trying different grades of fuel without mixing one fuel with another. For the smaller storage a horizontal tank of 8 ft. 6 in. diameter will be found very satisfactory, especially when placed under ground.

Tanks should be located as close to the furnaces as convenience of unloading will allow and with provisions for heating tank cars in cold weather. Steam is usually available and is the best and cheapest method. Storage tanks of 10,000-gal. capacity should be fitted with 100 lin. ft. of 2-in. wrought-iron pipe laid horizontally in the form of a rack and approximately 8 in. from the bottom and connected up with a 1-in. supply line for live steam and a 2-in. connection for exhaust steam. A 1½-in. pipe from the 2-in. steam coil will handle the water of condensation and without the gey-

ser effect observed with larger drain pipes.

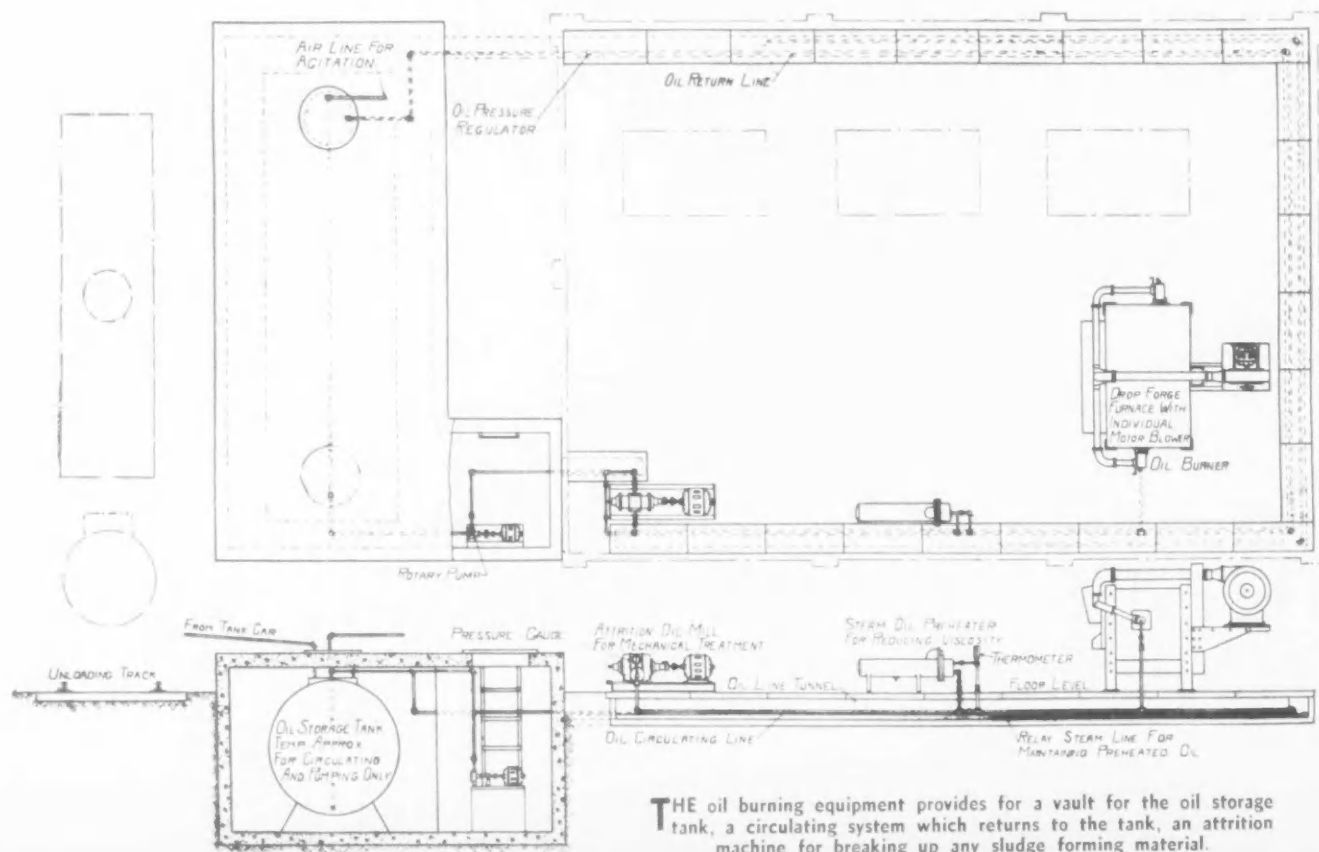
Regulation is accomplished by a globe valve conveniently located in the steam supply line only. The drain pipe should be left free since there is no need of pressure within the coils and the danger of leakage is much less. Oil storage tanks fitted up in this manner, protected from weather and with live steam, will be found satisfactory for all grades of fuel where the supply line to burners is kept hot by a parallel steam line from the pump location. If exhaust steam is available, use it but increase the heating coils 50 per cent.

Underground Vault for Storage Tanks

An underground brick or concrete vault is the best method of housing a steel storage tank. A door or cover will prevent the inflow of cold and the escape of heated air, and the dead air space thus provided is a very satisfactory insulation. A few reinforced concrete tanks are in use but owing to the communicated shock of large forging hammers there is the possibility of cracking and oil waste as a result. Concrete storage tanks if built should be lined or plastered on the inside with an insulating material to reduce the conductivity. Much of the heat is lost in warming up the surrounding earth.

Another plan is to house the tanks in a brick or concrete structure above ground but with the disadvantage of taking up surface space later needed

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THE oil burning equipment provides for a vault for the oil storage tank, a circulating system which returns to the tank, an attrition machine for breaking up any sludge forming material.

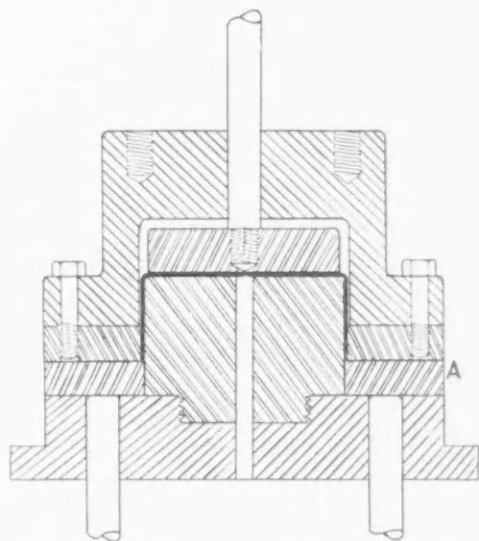
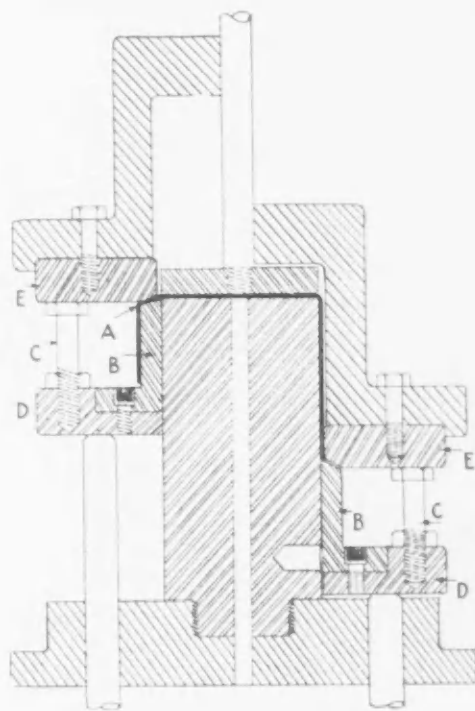


FIG. 1. — (At Left)
First operation deep-drawing die.

FIG. 2. — (At Right)
The half of the die at the right hand shows the completed operation with the die closed. The left half of the die shows the draw ring at the beginning of the down stroke.



Die for Deep Drawing of Shells

By RICHARD DALE

THE style of deep drawing die shown in the accompanying line sketches is one of the most efficient, and gives the least trouble of any die for this purpose with which the writer has had experience.

Although the first operation die shown in Fig. 1 must have spring pressure or air cushions under the bolster plate, spring pressure has absolutely nothing to do with keeping wrinkles out of the stock in the succeeding operations. Pressure is only used in these operations to hold sleeve *B* (shown in Fig. 2) and sleeve holder *D* up so that the tops of the adjusting screws *C* come firmly in contact with draw ring *E*. These dies can be used with equal success on either brass, copper, aluminum, stainless steel or deep drawing steel stock.

At the right, in Fig. 2, is shown the completed operation with the die

closed. On the up stroke the sleeve *B* carries the shell up with it and strips it from the stake. The left half of the die shows the draw ring *E* on the down stroke as it is ready to begin the reducing of the diameter of the shell. The space at *A* between sleeve *B* and draw ring *E* is set with the use of feelers to the thickness of stock by means of adjusting screws *C*, of which there are four. These screws should be of sufficient diameter to prevent any tendency to bend; 1 in. diameter is large enough. After the space through which the stock flows is right, for whatever the stock thickness, the adjusting screws are set tight; from then on no matter what the spring pressure is the drawing of the stock is not affected. The outside corner of

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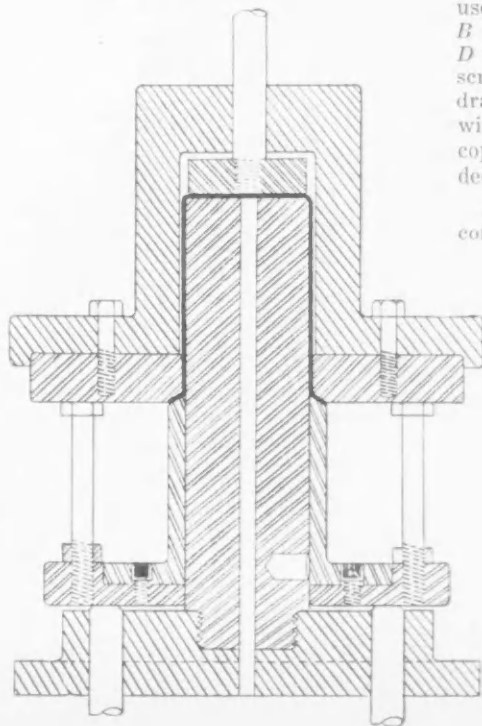
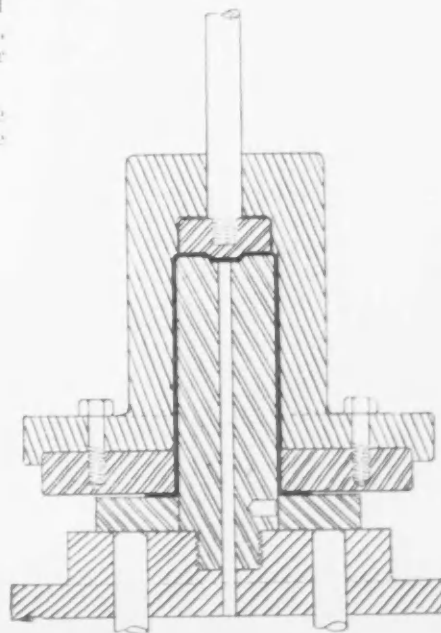


FIG. 3. — (At Left)
Third operation die.
The fourth operation is similar.

FIG. 4. — (At Right)
The fifth or finishing operation.



Fabricating Ford Lamps From Rustless Steel

By BURNHAM FINNEY

Detroit Editor, The Iron Age

ALL lamps for Ford cars have been made since 1924 in a plant at Flat Rock, Mich., designed and built by the Ford Motor Co. especially for the purpose of lamp production. In a manufacturing building 60 x 380 ft. and one story in height, with mezzanine balcony 35 x 160 ft., as many as two and a half million head lamps have been turned out in a single year, the average run being 6000 in an 8-hr. day.

In the fall of 1929 this plant began making rustless steel lamps and today all lamps, except those for commercial cars, are built of the so-called "18 and 8" metal. With the introduction of the Ford V-8 car the efficiency of the Flat Rock factory, already high, has been further increased by the use of new, high-production equipment, including automatic presses which stamp out in successive stages

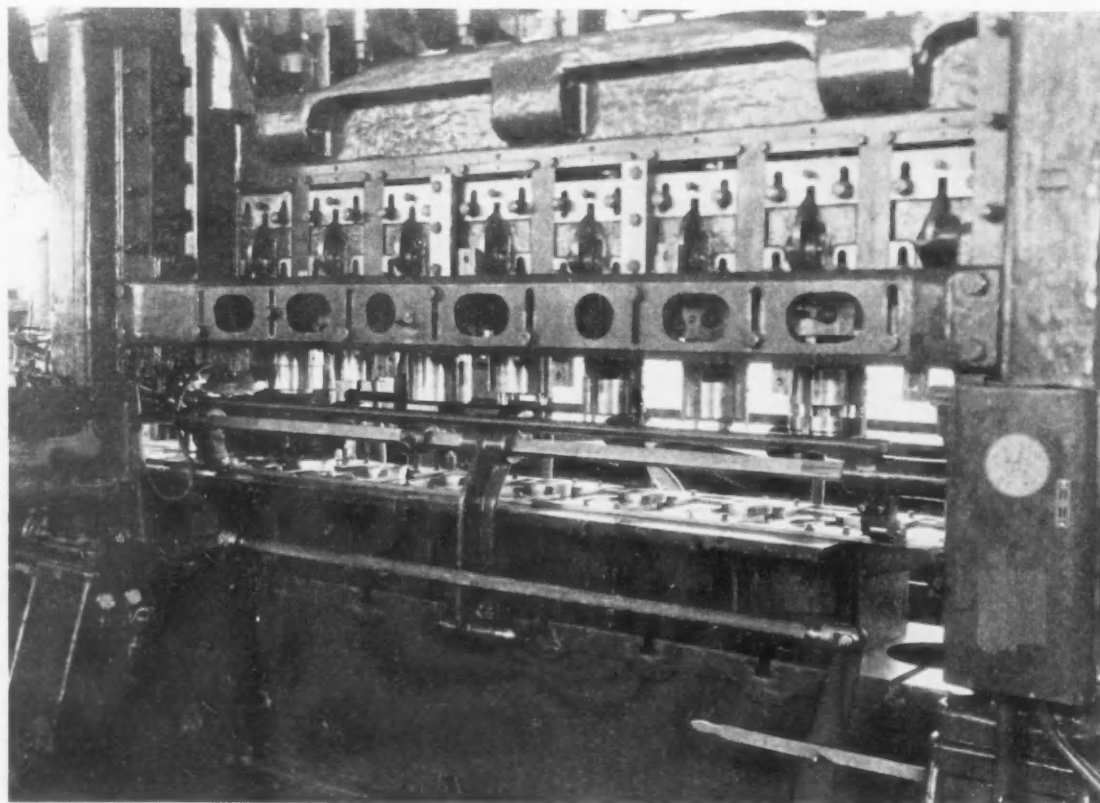
entire head lamp shells and tail lamp shells. Many of the presses and welding machines are of Ford design. The plant is completely conveyORIZED so that the work is brought to the operator who does not have to move from his station. Large machines for automatically polishing and buffing the rustless steel lamp shells are an outstanding feature.

It is significant that Ford's experience in fabricating lamps has proved that rustless steel can be used with only a slight additional cost compared with carbon steel, which is chromium plated to attain a bright luster. This is due to the ingenuity of the Ford company in developing unusually proficient fabricating processes.

Perhaps the most spectacular operation in the manufacture of Ford V-8 lamps is the stamping of head lamp shells from 0.025 in. gage rust-

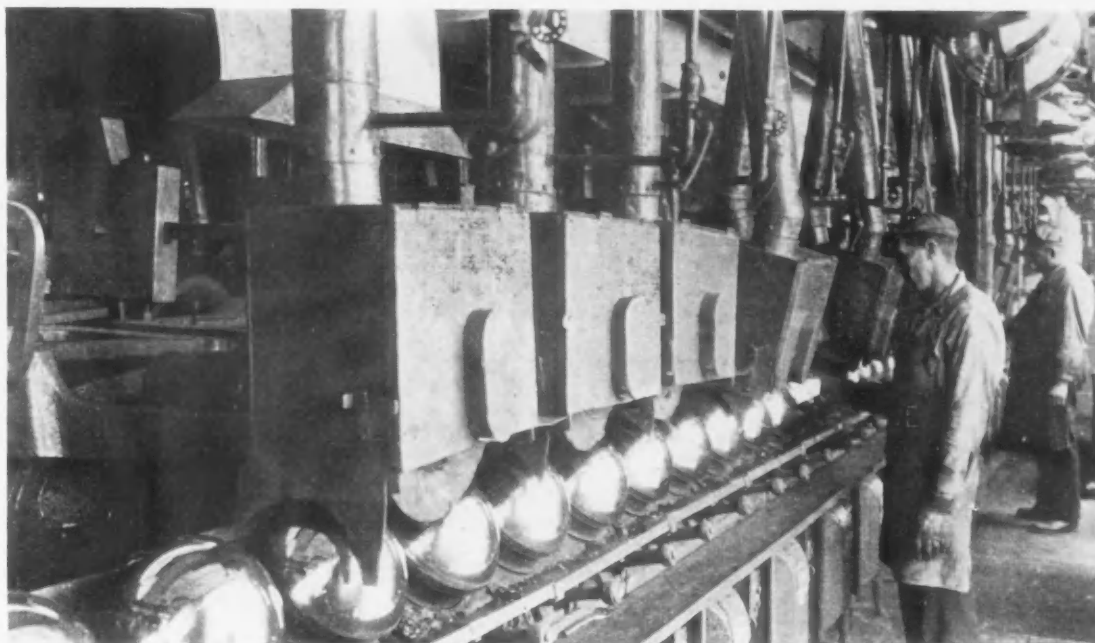
less steel on an automatic progressive press which performs eight operations: oiling the stock, first draw, second draw, trim, final draw and forming the flange in four successive dies. Aside from the loading of rustless steel disks in the magazine of the machine by an operator, the entire stamping process is automatic, including the ejection of shells and their passage on a belt conveyor to the next operation. About 400 disks are put in the magazine from which single disks are picked up by four air suction cups and placed in position to receive an automatic spraying of a special drawing compound composed of a definite quantity of lithaphon, cup grease, sulphur, talcum powder and paraffin oil, thoroughly mixed.

Two long steel arms convey the blanks from one die to the next, the arms being equipped with jaws which



▲▲▲
EIGHTEEN head lamps are stamped every minute on an automatic progressive press which performs eight operations. At the time the machine was photographed it was set up for another job.
▼▼▼

Head lamp shells are buffed to a mirror-like finish on automatic polishing and buffing machines which have 36 carriages each with two fixtures to hold lamp shells. Each buffing wheel is driven at 3600 r.p.m. by a 5-hp. motor.



grip the blanks on both sides during travel. As a blank enters the first die, a finished stamping is automatically delivered to the belt conveyor at the discharge end of the machine. The crankshaft of the machine turns in four bronze bushed bearings and is driven from both sides by means of double-back gears. Slides move in extra long adjustable guides and each tool can be separately adjusted. The throwing-in gear is operated by a friction clutch with non-metallic facing to eliminate scoring, this arrangement making possible the starting and stopping of the press instantly and without jerks at any place along the slide.

Pneumatic die cushions are large, each one having a separate tank. The machine's frame is an electric iron casting reinforced by steel bolts. The press, which weighs 143,000 lb., is driven by a 50-hp., 1800-r.p.m. motor with Texrope drive of 50 per cent overload. It produces 18 lamp shells per min. The blanks entering the machine are 13 3/4 in. in diameter and are drawn to a depth of 4 9/32 in. in three operations. The distance from tool to tool is 15 in.

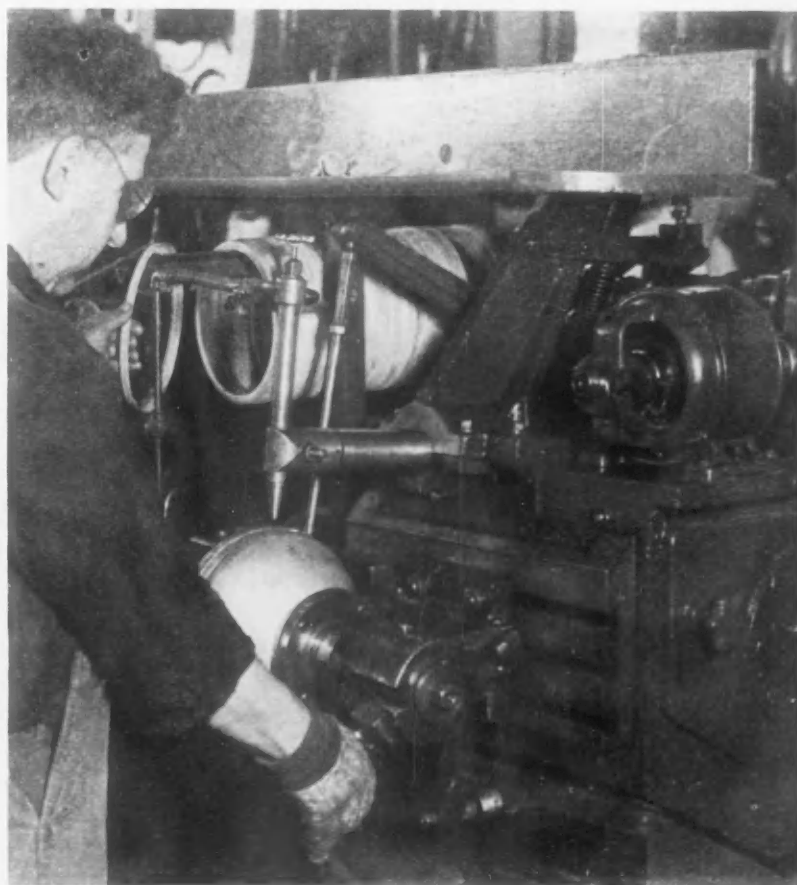
The head lamp rim or flange, made of cold-rolled, low carbon strip steel cadmium plated, is spot welded onto the rustless steel head lamp shell on a spot welding machine designed by Ford engineers. The operator puts the two parts onto a fixture on the welder and trips a foot treadle, the machine automatically indexing, welding and stopping until six spots are welded. Using 30 kva. power, an operator puts 2300 pieces through this machine in 8 hr.

Two reflector lugs are embossed and the door spring flange formed on small presses, after which the head lamp passes through inspection before going to the polishing and buffing machine. Arranged in the form of a

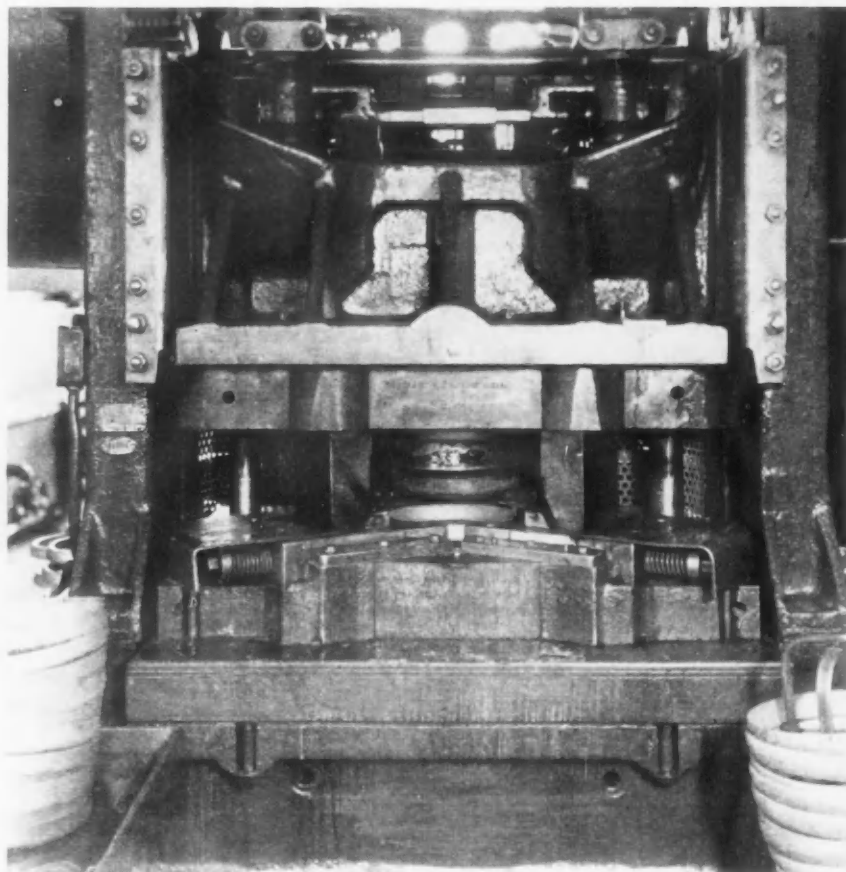
rectangle, this machine is 40 ft. long, 12 ft. wide and has 36 carriages each with two fixtures to hold lamp shells. These carriages move down one side of the machine where the lamp shells are polished and up the opposite side where they are buffed to a mirror-like finish with cloth buffing wheels.

There are three separate consecutive settings of the polishing and buffing wheels in order to cover the full surface of the lamp shells.

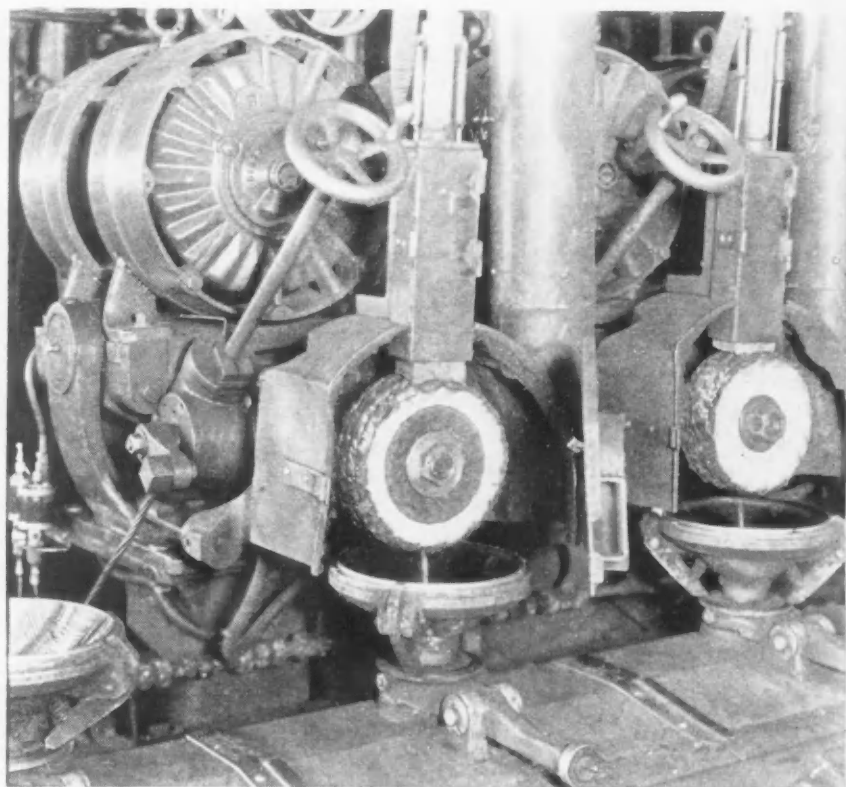
Each wheel of the machine is driven by a 5-hp. motor, the polishing wheels being operated at 1800 r.p.m. and the buffing wheels at 3600 r.p.m. Six men



The head lamp rim or flange, made of cold-rolled, low-carbon strip steel cadmium plated, is spot welded onto the rustless steel head lamp shell on a machine designed by Ford engineers.



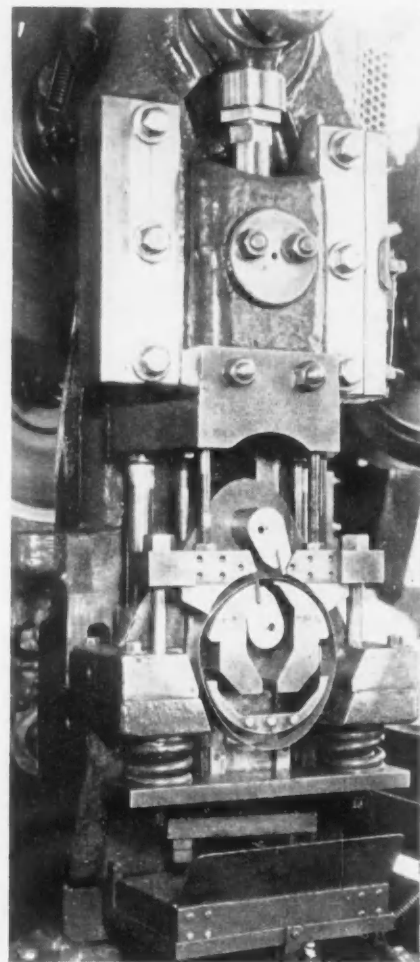
Rims are pressed out into final shape in a die having a rubber expander.



The buffing compound is applied automatically to the buffing wheels for lamp reflectors. As the buffing wheel feeds down onto the reflectors, an air pressure valve is automatically tripped, turning on the air and pushing the cylinder containing the compound down onto the work for a fraction of a second.

service a machine, two men on each side working up and down the line applying a rustless steel buffing compound with a brush to the lamp shells and two men loading and unloading the shells.

After being inspected, lamp shells pass to a small press where two bracket holes and six rivet holes are punched and the Ford name is stamped on them. They then are hung on an overhead conveyor to go to the assembly line. Here automatic riveting presses are used. After the case assembly, there is a restriking



After being butt welded, the rim is slipped on a steel die, in a special machine, which is expanded to the proper diameter of the rim to draw the rim tight. The operator then trips the machine and a shear action trims the flash.

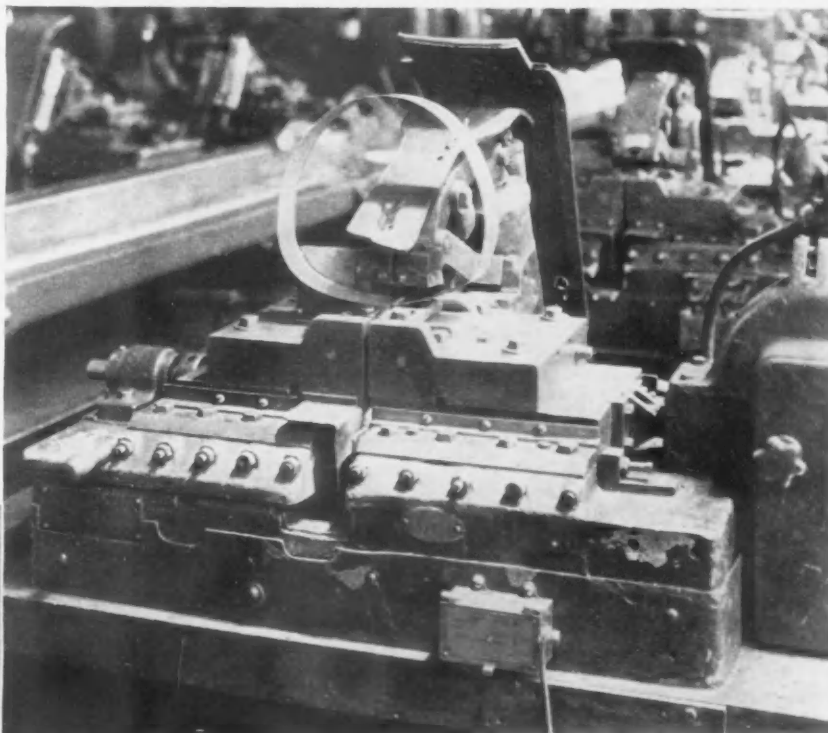
operation on a press to tighten the rivets.

The head lamp door frame is made from 0.025 in. gage rustless strip steel 1 27/32 in. wide. After it is flattened in a press, the strip is welded into a round rim on a special butt welding machine of Ford design. Operation of an air cylinder and a piston results in the rim being clamped by jaws which hold it firmly during the welding cycle. The rim then passes to a special machine, where it is slipped on a steel die which is expanded to the proper diameter of the rim to draw

tight. The operator trips the machine and a shear-like action trims the flash left by the butt welding.

Rims are placed on a belt conveyor for passage through a continuous-type washing machine in which the drawing compound is removed. They are pressed out into the final shape in a die having a rubber expander. The inner edge of the rim is spun on a special press, after which the rims are buffed and polished on an automatic machine similar to the one used for head lamps, except that fewer wheels are necessary because of the smaller surface of the rims.

The body and door of the tail lamp are made of rustless steel, the body



The rustless steel strip for the head lamp doorframe is welded into a round rim on a special butt welding machine of Ford design.

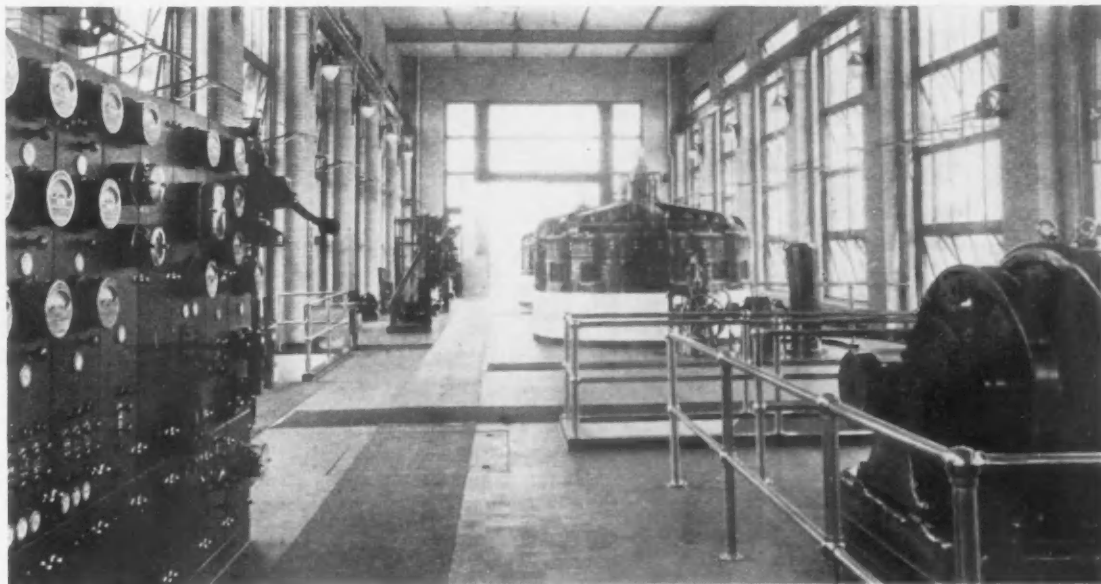


An area half an inch in diameter is spot annealed around the angle hole of the tail lamp shell prior to forming the hub on the hole, which is a severe drawing operation.

or shell being formed in eight operations on an automatic double-crank press similar in principle to the one for forming the head lamp shell. The operations include a draw and trim, final draw, three flanging operations, piercing and flanging the hole and perforating a half-inch flange angle hole. A special automatic feeding device eliminates all handling except the stacking of the disks, which are 6¼ in. in diameter. When the shell emerges from the machine it is about

(Concluded on Advertising Page 20)

▲ ▲ ▲
A VIEW of the two 350 - kw. water turbines. The plant is run partially on water power derived from the Huron River, the remainder of the power being supplied from the power plant at Rouge.
▼ ▼ ▼



The Finishing of Rolls by Grinding—IV

By **CARL MOREY**
Consulting Engineer, Big Rapids, Mich.

FREQUENTLY, various so-called improvements are designed into roll grinders. Some of these have merit and definitely improve the functioning of the grinders, while others are discarded, never getting further than a test machine.

Among these improvements was one known as a swing rest, which was applied to a two-wheel machine. It consisted of an auxiliary carriage hung on knife edges, and carried the two wheel-assemblies. The function of this was to eliminate any possible misalignment or deviation from dead straight in the machining of the ways. It allowed a floating action of the wheel assembly. The first installation was applied to the grinding of long, slim rolls for paper calenders; and machines of this type are still manu-

factured and used extensively in the paper industry.

Another innovation was the mounting of the motor rotor directly upon the spindle, thus eliminating belts, pulleys, etc., in the wheel-drive. This arrangement is a commercial proposition, but up to date it has not been universally accepted. The thought, however, is not new, since several grinder builders have had it under consideration for several years.

Large Rolls Bring New Bed Design Problems

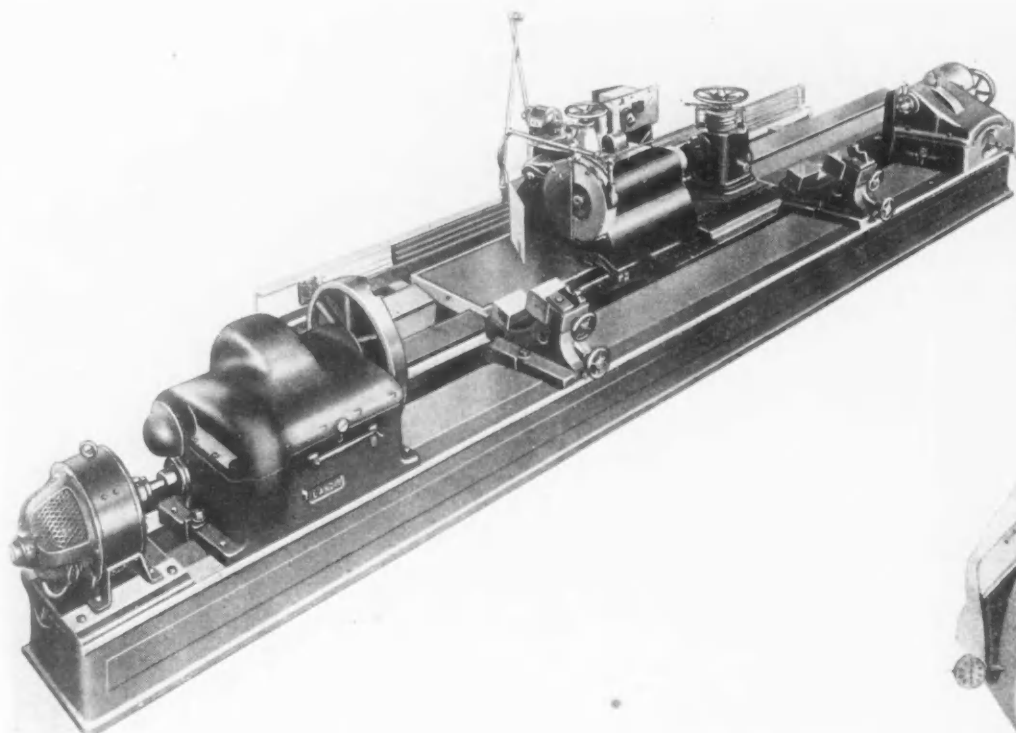
Roll-grinder beds, while the simplest part of the machine insofar as mechanism is concerned, have varied in design quite as radically as other parts of the machine. The introduction of very large rolls brought a new prob-

Some improved features of roll grinders, including swing rests on two-wheel machines, motorized spindles and other components are covered briefly in this concluding article of the series.

Modern engineering has taken the so-called "mystery" out of roll grinding, says Mr. Morey; many machines with as many different characteristics are available and will do satisfactory work.

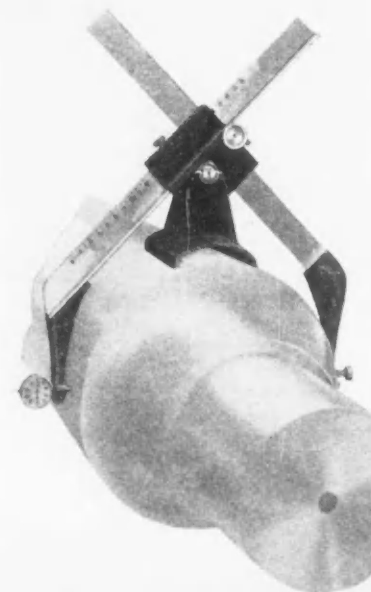
The previous articles were published in **THE IRON AGE** of June 330, page 1388; July 14, page 54; and July 28, page 140.

lem into their design. On any machine in which the work bed is bolted rigidly to the carriage bed, the tremendous weight of a 150-ton roll concentrated at two points (neck rests) deflects the work bed. Since both sections are bolted rigidly together, this deflection distorts the carriage bed. This condition is highly objectionable, since every effort is exerted to keep the carriage bed straight and undisturbed. It is obvious that two concentrated loads of 75 tons or more will deflect the bed, so it is essential that

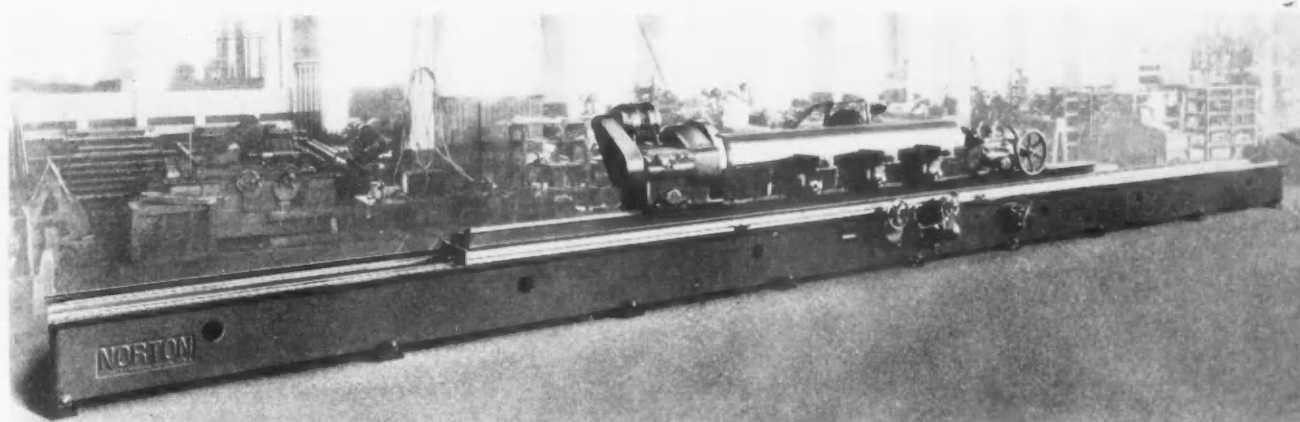
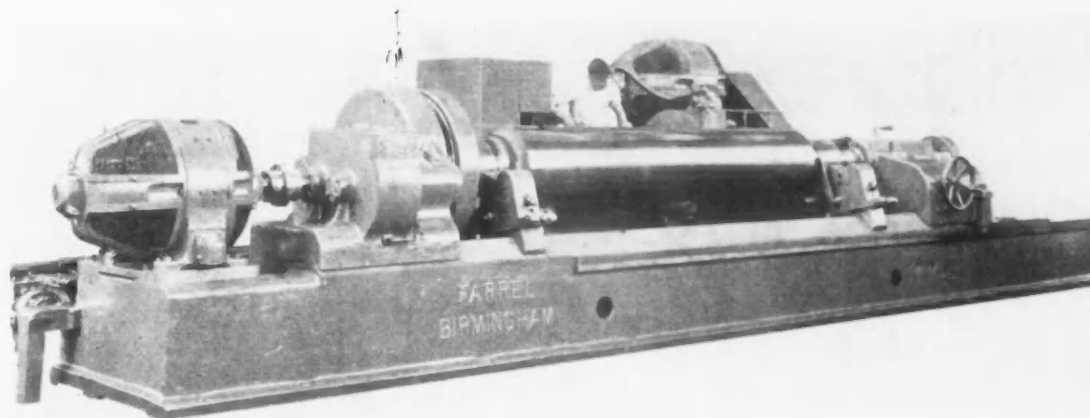


50-in x 25-ft, heavy-duty traversing wheel base type roll grinder built by the Landis Tool Co.

Typical roll caliper. By setting the indicator at zero at the end of the roll and moving it to the center, the indicator will register the difference in diameter.

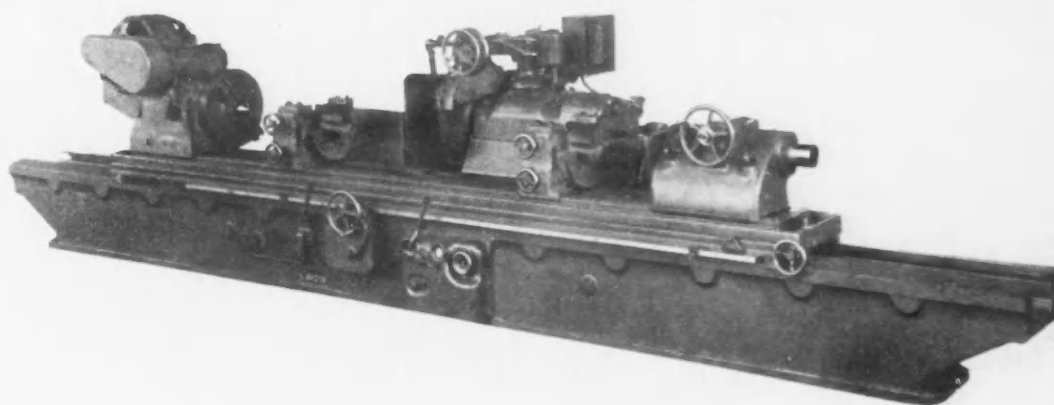


44-in. x 18-ft. heavy-duty roll grinder built by the Farrel-Birmingham Co.



(Above) 36-in. x 288-in. type D motor-driven grinder built by the Norton Co.

(At Right) 24-in. hydraulic traversing-table type roll grinder built by the Landis Tool Co.



it rests upon a solid concrete or masonry foundation of such stiffness that it will not permit the bed to deflect. It follows that less dependence can be put in the cast iron and more in the foundation.

One European builder, recognizing this fact, brought out a machine without a work bed at all, in the sense we consider it, but placed a "T" slotted rail in the foundation. The neck rests are in the form of bridges extending from the carriage bed to the rail. The arrangement is such, however, that the rail takes nearly all the load, the carriage bed merely serving as a means of alinement. Another asset in the rail-bed idea is that, should a roll be dropped, it would do very little damage, since the rails could be made

of steel castings, and in short sections that could easily be replaced.

Spindles and Bearings Given Close Attention

The spindles and bearings of roll grinders have been the subject of much thought. Since, in crowning or concaving a roll, the movement of the wheel toward and away from the work must be very precise, it is important that the clearance in the bearings be as small as possible. Bronze is perhaps the favored material at present, but a properly designed babbitt bearing with a modern system of lubrication has much in its favor, since it can be operated with much less clearance.

On table-type machines, especially in the larger sizes, there are some dif-

ficulties to overcome that present rather hard problems to the designer. Since the table carries the work, there is a wide range of loads to be moved. This affects the lubrication of ways, the power input of the traversing mechanism, the traversing mechanism itself, and the bed. It is the contention of some builders that better work is obtained on a table-type machine, and units have been built having a bed length of nearly 75 ft. made in two sections. This machine is rated as a 44 in. x 227 in.; the latter figure designates body length only, length between centers being nearly 72 in. more, or nearly 300 in. The total weight is nearly 120,000 lb.

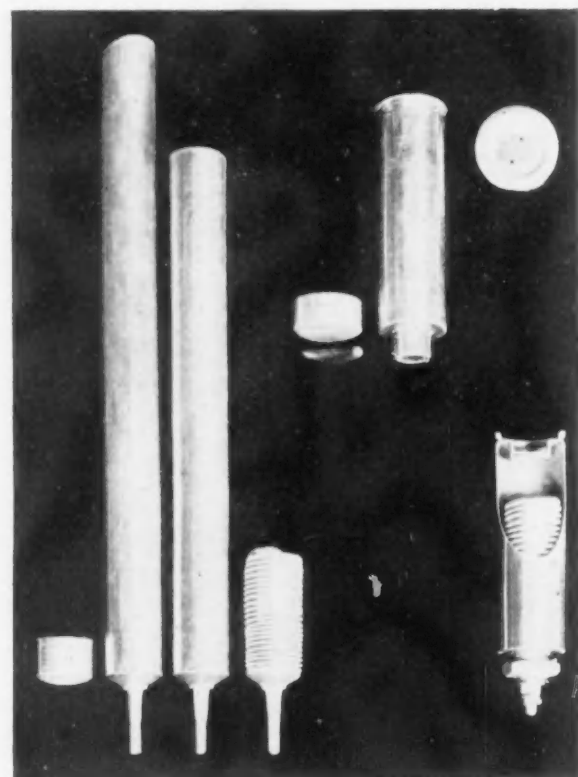
On the other hand, the two-wheel traversing-wheel-base type, is built up
(Concluded on Advertising Page 20)

Electrolytic Condensers Produced in Aluminum by Impact Extrusion

THE flexibility of the impact extrusion process and the versatility of aluminum prove a distinct asset in the fabrication of electrolytic condensers for use in the filter circuits of radio sets, or wherever high capacity in small volume is required. By means of this more recently developed type of extrusion, it is possible to convert a simple blank of aluminum into semi-fabricated tubular anodes and cathode cans which can be finished with but few secondary operations.

The anode is made from high purity aluminum and the cathode from commercially pure metal. The cylindrical slugs for these sections of the condenser are blanked from heavy plate, annealed and lubricated prior to extrusion. The anode is produced from the blank as a tube with a protruding neck in one stroke of the press. The tube, thus formed, is trimmed to the desired length and the stem threaded. After being annealed, it is fluted with helical ribs. This reduces its length to about one-quarter of that of the original tube. The anode is then given a dielectric oxide coating.

▲ ▲ ▲
STEPS in the production of a typical 8 microfarad condenser. Larger sizes for condensers of larger capacity are also made.
▼ ▼ ▼



The cathode is produced in much the same manner as the anode, being trimmed and flanged and the neck threaded after extrusion. The stiffness of a can of this type is a distinct advantage in that the cathode is the outer container of the condenser and must resist denting from handling. The cathode is frequently chromium plated on the inside to get certain desired electrical characteristics. In assembling the condenser, the coated anode is mounted by means of a rubber insulating bushing with its stem projecting through the hole in the

neck of the cathode. After filling the cathode can with electrolyte, a cover piece containing a venting device is double-seamed to the open or upper end.

Many different shapes can be produced in aluminum by impact extrusion. Articles can be formed in one operation by this process which would require several different operations if produced in any other manner, and because of the ease with which aluminum can be worked, unusual combinations of forging or stamping and extrusion are possible.

Light-Weight Transport Trailer

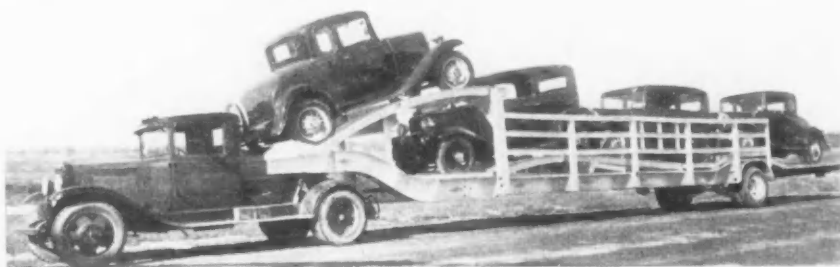
AN automobile transport trailer, designed to handle four medium-size passenger cars or two small passenger cars and two dual wheel trucks, has recently been built of Dowmetal. It is floored over with heavy Dowmetal plates and is provided with side stakes and rails suitable for hauling a return load of general freight. Its

total weight is 4180 lb.; if flooring, stakes and rails are omitted, making a single-purpose trailer adapted only to hauling automobiles, the weight is reduced to 2850 lb. This compares with 8700 lb. for a wood-floored steel trailer of the same capacity and 5700 lb. for the steel trailer without the flooring. Reduced operating expenses and lower cost of tractor unit which pulls the trailer result from the saving in weight.

The trailer is loaded from the rear

by one man, using the hinged loading device shown. The ramp, loading device and rear skids are surfaced with Dowmetal subway grating which provides a non-skid surface when wet or dry. The skids weigh only 60 lb. each. Fabrication of the Dowmetal frame is held to close limits and a large safety factor is assured.

A 28-ft. trailer, designed to haul four cars of Buick size, keeping within the 40-ft. overall length specified by some States, is under construction. It is stream-lined and has capacity for 8 tons of general freight in the 800 cu. ft. weatherproof body. Weighing 3800 lb., it can be handled easily by a 1½-ton tractor when loaded with cars averaging 3400 lb. each, and offers a solution to the problem of transporting new automobiles in States with severe restrictions regarding trailer lengths. Dowmetal, which is the lightest structural material made, is the product of the Dow Chemical Co., Midland, Mich.



Open-Hearth Charging Boxes Will Test Welded Construction

By HARRY E. STITT
Chief Engineer, the Austin Co.

AS a demonstration of the application of welding to the steel industry, the welding division of the Austin Co. has just fabricated four welded open-hearth charging boxes for the Otis Steel Co. These boxes have just been put into service at the Riverside plant in Cleveland.

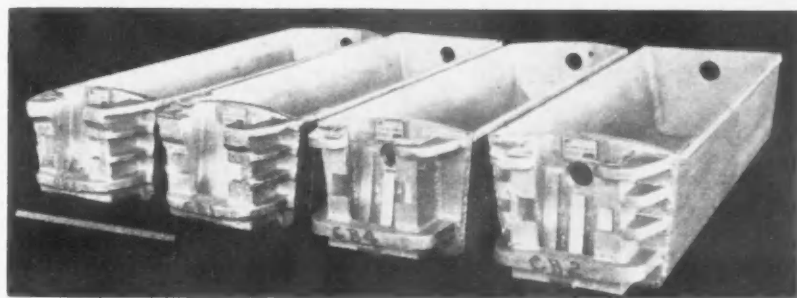
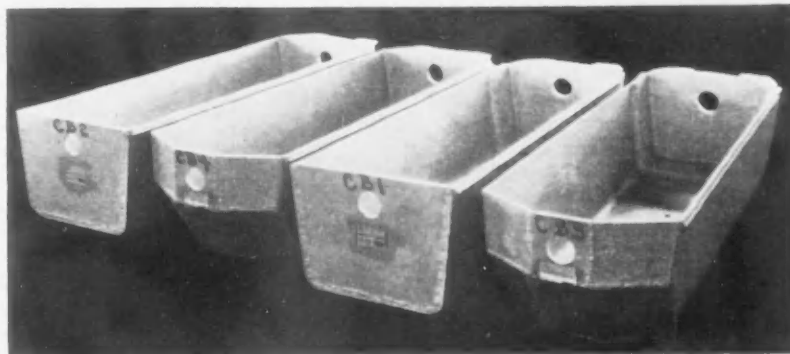
Open-hearth charging boxes were selected for the welding demonstration for the following reasons:

1. They are subject to such severe usage and service in respect to both heat and strains as to make the results indicative of other welded construction possibilities in the steel industry.
2. They permit of variation in design for purposes of comparison.
3. They could be conveniently introduced into the regular operation of

the boxes were varied to determine minimum requirements.

A one in. half round strip was welded along the outside of the side top edges of the boxes.

cast ribs make them look lighter. The vertical tapered bars on the welded heads are replaceable. They were furnished to produce the curved surface to fit the front face of the end



the plant without awaiting new construction or the rebuilding of a mill or furnace.

The boxes averaged 2 ft. 6 in. wide, 1 ft. 9 in. high and 8 ft. long. The following points in regard to their design may be of interest:

As four boxes were ordered, it was decided to make two boxes with welded head ends and two with cast steel head ends. There was a pattern available for the cast steel head ends and this accounts for the wide cast steel flange used. It was thought best for comparison purposes not to chance any impairment of the casting by reducing the flange width.

Two of the front ends were made rounded and two square, to get the relative advantages of both types from all standpoints.

The plates in the body and ends of

Electric arc-welding was used throughout. Special pains were taken with the design and fabrication in order to assure welds which should be stronger than the parent metal. Naturally the requirements for parts which are subjected to such severe service are determined more by usage and practice than by calculations. However, it should be appreciated that welds are as capable of analysis and proper specification as are other types of fabrication. The welding technique used on these boxes was the best that has been developed.

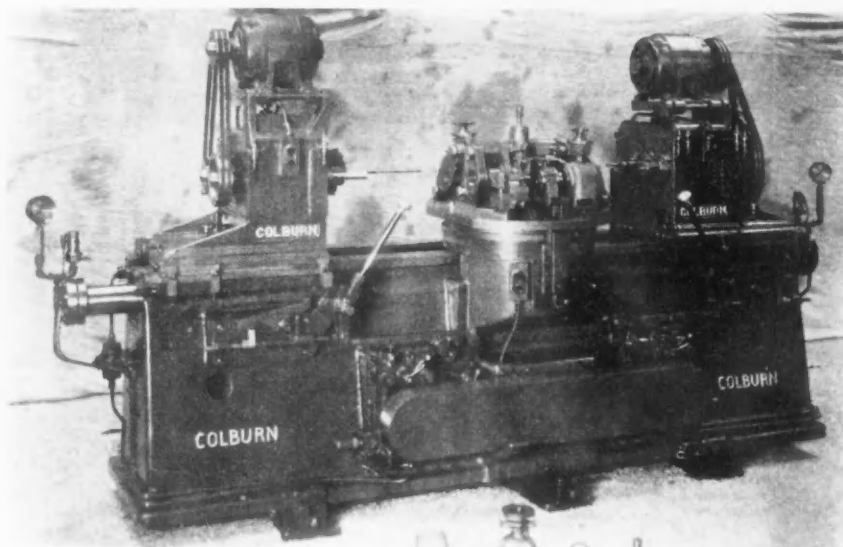
Various Designs Used

The illustrations give an excellent idea of the variation in construction. The ribs on the welded heads are approximately the same thickness as the ribs on the cast heads, although the draft and the rounded corners of the

of the peel on the charging machine. An indication of the size of the boxes is made by the 3 ft. rule shown in the pictures.

We intend to keep these charging boxes constantly in line and an automatic record will be made because of the different tare weight which will be used for the four welded boxes and their car. After a few months of operation we will then be able to determine the most desirable combination from the variations in design employed. It is expected that a report will be published showing the service that the various types of boxes rendered.

Use of silicon-manganese alloys for the deoxidation of steel, leading to the production of a cleaner product, is discussed in technical bulletin No. SM-I recently issued by the Electro Metallurgical Co., 30 East Forty-second Street, New York. Proper use of alloys of silicon and manganese in correct proportion leads, it is stated, to the formation of large slag particles which rise rapidly to the surface of the molten bath, with resulting decrease in the number of undesirable inclusions remaining in the steel. Use of these alloys is claimed to make it possible to produce a cleaner steel in a shorter time and at a lower cost than by the usual methods.



Builds Hydraulic-Feed Finish-Boring Machine for Small Parts

THE Colburn division of the Consolidated Machine Tool Corp. of America, Rochester, N. Y., is offering the finish boring machine illustrated, which is equipped with hydraulic feed and employs either diamond or cemented-carbide tools. The machine is designed for the rapid production of small parts made of cast iron, non-ferrous metals, fiber, etc., that are required to be finish bored with extreme accuracy.

The unit illustrated was built for finish boring the cylinder, piston and connecting rod of a refrigerator compressor. It has five spindles, three in the right-hand and two in the left-hand head, and has a complete hydraulic cycle, boring five straight holes in three different parts. Indexing the table, starting the cycle, and unloading and loading are the only manual operations.

Each of the opposed spindle heads has independent feed and traverse movements, and the indexing table carries two complete sets of holding fixtures. With this arrangement, all spindles in both heads can work simultaneously on the pieces in one set of fixtures while the second set of fixtures is being unloaded and loaded. Operation is virtually continuous, as little time is required for indexing the table.

The number of spindles and type of indexing table furnished depends upon the nature of the work, production required and variety and size of parts to be finish bored.

Hydraulic equipment for feed and traverse of the spindle heads is driven by a single motor, which, with the two pumps, is located in the base. The spindle motors are carefully balanced, and drive the spindles through mul-

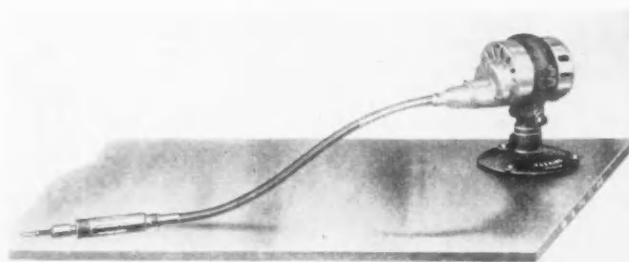
tipple V belts, no gearing being employed. This construction, it is pointed out, is simple and eliminates chatter marks in the finished work. Spindle speeds up to 2620 r.p.m., giving cutting speeds up to 300 ft. per min., were furnished on the machine illustrated. The feed rate is variable from zero to maximum.

Flexible-Shaft Bench Mounted Screw Driver

TO facilitate driving and setting screws and nuts located in a horizontal plane, in inaccessible places, and at different angles, the R. G. Haskins Co., 4636 West Fulton Street, Chicago, is offering the new equipment here illustrated. This machine, which is designated as the type BHF, is a combination of the company's standard screw driving unit and flexible shaft drive arranged for mounting on a bench.

The clamp ring that supports the screw driving unit is mounted on the base in a manner that permits free swiveling action. This, together with the flexible shaft, gives complete freedom of action, permitting the operator

Screws and nuts located in a horizontal plane, at an angle, or in inaccessible places may be driven or set quickly.

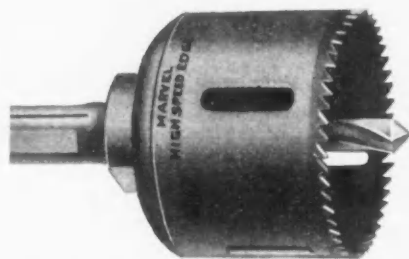


to apply the screws and nuts rapidly. Means are provided for locking the unit in the most convenient position.

The hand-piece containing the bit or wrench can be placed on the bench in any location convenient for the operator. The unit includes the Haskins sensitive tensioning device designed to assure driving of screws and setting of nuts with uniform tightness. The flexible drive, it is stated, operates without shock, strain or twisting action to the operator's wrist. This machine can also be mounted on a movable stand so that it can be taken to the work.

Hole Saws Equipped With High-Speed Steel Teeth

THE Marvel high-speed-edge hole saw illustrated has teeth which are made of 18 per cent tungsten high-speed steel, welded to an alloy steel non-breakable back or body. It is



Saw made in various sizes up to 4 1/8 in. for cutting holes in steel, wood and other materials.

manufactured in 26 sizes by the Armstrong-Blum Mfg. Co., Chicago, for cutting holes ranging from 3/4 to 4 1/8 in. in diameter, in wood, steel, cast iron, brass, copper, bakelite, slate, marble and other materials. Arbors, which are priced and packed separately, are made in two sizes, one for hole saws 1 1/2 in. in diameter and smaller, and the other for saws larger than 1 1/2 in. High-speed steel pilot or center drills are furnished with the arbors.

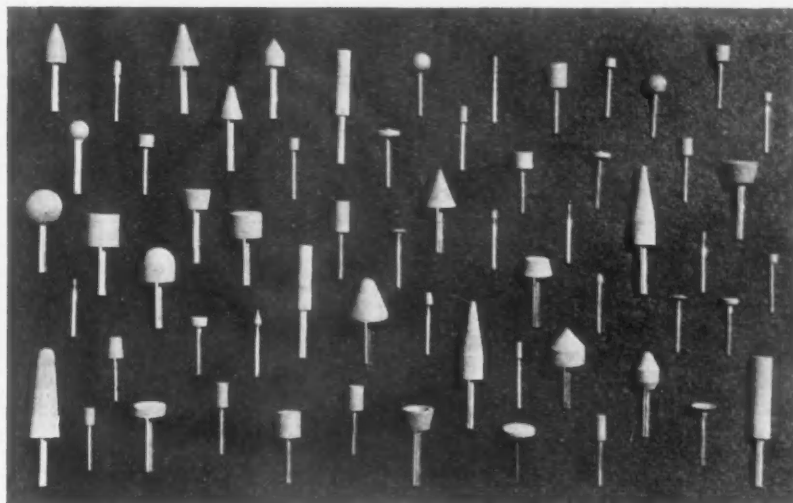
Babbitt metal production in June amounted to 1,319,245 lb., compared with 1,345,685 lb. in May, according to report of the Bureau of the Census. Output in the first half of 1932 aggregated 9,000,703 lb., as against 15,052,675 lb. in first six months of 1931.

Small Abrasive Shapes for Hand Grinding

MOUNTED abrasive points, wheels, pencils, buttons and other special small shapes have come into common use, which fact has led the Norton Co., Worcester, Mass., to develop a rounded-out line of abrasives and bonds. This line now comprises 100 different shapes, which can be used in any standard machine. They range from points $3/32$ in. in diameter to 1-in. wheels. Their variety is indicated in the accompanying photograph.

Many of these tools are of 38 alundum abrasive, developed expressly for tool and die work. For production grinding of small holes the regular alundum abrasive is used in most cases for steel, and crystolon abrasive in the non-ferrous and non-metallic fields. Vitreous bonds are employed in most instances, but there are bakelite-bonded points and wheels as required for specific purposes.

The spindles in all cases are of a special steel, knurled and chisel-



Abrasive shapes, for tool and die work, for non-metallic and non-ferrous as well as ferrous materials, are commonly used in high-speed hand-grinding machines.

scored to insure permanent anchoring to the quill. They are first coppered and then nickel-plated, and are mounted in a special cement.

The field of usefulness of these tools is constantly broadening, according to the Norton Co.'s experience. One interesting application is in the stone-cutting trade, where special shapes are used in smoothing up carved and chiseled work. Another use is in the manufacture of pottery, for removing blemishes before glazing. Yet an-

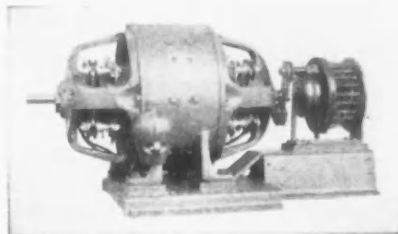
other application is in the replacing of files, chisels, scrapers and other hand tools in die-sinking, molding and other fine work of similar character, a use growing out of the development of high-speed portable and hand grinding machines which run at rates varying from 60,000 to 100,000 r.p.m. A large field is in internal grinding, permitting accurate fashioning of holes 4, 6 and 8 mm. in diameter on the new high-speed internal grinding machines.

Develops Constant-Tension Regulator

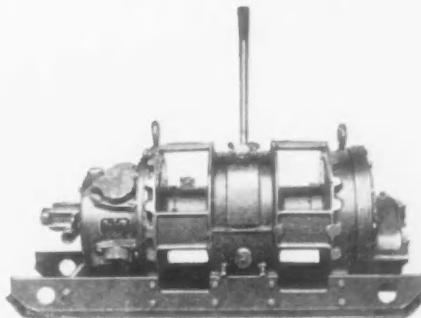
The constant-tension regulator recently brought out by the Reliance Electric & Engineering Co., Cleveland, is for use with devices such as reels for winding strip steel, copper or brass and other material. Constant tension at any speed at which the material is being wound or treated is claimed for this apparatus, which is easily adjusted and when once set does not change. Maintenance, it is stated, becomes negligible.

The regulator armature has two windings—the "torque" winding and the "spring" winding. The torque winding is connected in series with the motor driving the machine which is winding or pulling the material. The spring winding (so called because it acts in a direction opposite to the torque winding) receives its power from the main line. When the current in each of these windings is equal there is no movement of the regulator. If the current in the torque winding increases or decreases, there is an increased or decreased torque in the motor which it is regulating. This causes a movement in the regulator, and the rheostat which is coupled to the regulator shaft corrects the voltage to the driving motor to keep the torque constant.

For unwinding at constant tension this regulator is also suitable. It is used in conjunction with a generator to keep the material being unwound at an even tautness. Various sizes of these constant-tension regulators are made.



Constant-tension regulator for use with reels, etc., for winding strip steel, brass and other materials.



Double-drum air hoist rated at 1500-lb. pull at 175 ft. per min.

Portable Double-Drum Air Hoists

SINGLE-LEVER control of the clutches and throttle valve, giving ease of operation and safety, is a feature of the double-drum Utility air hoists developed by the Ingersoll-Rand Co., 11 Broadway, New York. Applications include slushing and scraper loading in mines and quarries, sand and gravel pits.

The control lever is located at the center and rear of the hoist. Swinging it sideways serves to engage the internal expanding clutch of either of the two drums, and pushing it forward admits air to the motor. Only one clutch can be engaged at one time. Motor speed is controlled by the forward position of the lever. Variations in drum speeds are regulated by the lever and without slipping the clutch. The motor need run only when the hoist is actually pulling, thus reducing air consumption. The lever returns automatically to neutral if released.

Drums, clutches and brakes are inclosed and protected by the cylindrical cast-steel housing. Helical main gears are employed. The air motor is of the radial-four cylinder type. The entire hoist is mounted on steel skids, giving a strong and convenient arrangement for spragging. Four sizes are made.

Improved Heavy-Duty Press

HEAVY-DUTY presses of improved design have been announced by the Toledo Machine & Tool Co., Toledo, Ohio. The illustration shows one of a pair of these new machines, shipped recently to an automobile manufacturer for use in heavy squeezing, embossing and sizing operations.

Massive construction is a feature. The frame is a single steel casting of heavy cross section, reinforced by four large steel tie rods shrunk in place. The legs, or supporting blocks, which are used only when no pit is wanted, are of unusually substantial construction. The heat-treated steel full-eccentric type crankshaft is of large diameter. As there is no adjustment in the steel connection, solid metal is provided between the crank and the slide. A wedge adjustment is provided under the bolster. All bearings are bronze bushed.

The slide is a long steel casting and is guided in the front by bronze-faced gibs. Bolted against the frame, these gibs tie the uprights of the press together, thus adding to the rigidity of the machine. The front gibs are continuous from the top to the bottom of the slide. Four taper bronze gibs are set in the frame of the press in back of the slide; these permit adjustment for possible wear, assuring proper alignment of the slide. It is stated that as the slide is guided both top and bottom there is no possibility of tilting. The press is arranged for receiving a lower cam-actuated knockout and an upper knockout.

Single gearing is used so that the press may be operated at a high rate

of speed for a press of this size. Steel herringbone gears with cut teeth are employed, and the gears are incased in a cast-iron guard that contains lubricant, which assure both safety and quiet running.

The press is controlled by the Toledo improved multiple disk friction clutch with independent brake on the backshaft, and the operating mechanism is air-controlled by the foot treadle. This mechanism is so arranged that the press may be operated continuously and stopped at will, or, by making a slight adjustment, the press will make one cycle for each depression of the foot treadle and stop at the top center. A 30-hp. motor mounted on top of the frame transmits power to the flywheel by means of V-belts.

Stub Lathe Designed to Use New Cutting Tools

THE Junior Stub lathe brought out recently by the Sundstrand Machine Tool Co., Rockford, Ill., is claimed to have the strength, weight and rigidity that permits effective application of more power than usual for a lathe of its type and, through suitable speed and feed ranges, to permit efficient use of cutting tools of all types, including cemented-carbide and diamond tools.

Various features provide strength and operating convenience. Headstock and bed are cast in one piece. The cover plate on the headstock is recessed to form a tool tray, which may be removed easily in order to apply a third slide. The master control lever above the headstock operates the spindle, feed clutches and brake. A large hole in the spindle permits in-

section of draw rods, and provision is made for mounting non-rotating air cylinders or other chucking equipment on the rear end of the spindle. The heavy spindle is machined inside and out for balance, and is mounted in anti-friction bearings. The tailstock also carries anti-friction bearings. The tailstock quill is traversed and clamped by a single lever. A large quill has been provided to permit ready adaptability to power operation.

Both front and rear carriage are unusually heavy. A cam bar attachment may be mounted on the front of the apron, with the bracket adjustable on the bed to permit the use of a short bar and to facilitate setting. The attachment is used for automatic rapid approach of the front tools to the work and in form or taper turning. A trip dog bar is attached to the bottom of the apron and actuates the automatic control of spindle and feeds. An adjustable dog at the center of the trip dog bar automatically disconnects the drive to the feeds and the spindle, and applies the spindle-brake. The feed rack is provided with helical teeth to produce smooth, continuous motion. An automatic tool relief attachment can also be furnished. At the front of the headstock, behind the handwheel, is a lever for manual feed disengagement.

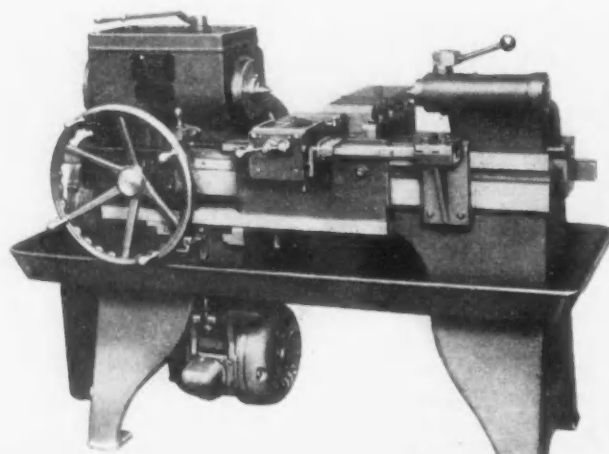
The rear carriage is longitudinally adjustable and carries a slide actuated by drum cam to provide desired feed movement, including dwell. A large handwheel facilitates rapid movement of the front carriage and the rear slide. Independent pick-off gears are provided for front and rear tool feeds.

With a 5-hp. 1200-r.p.m. motor, the spindle speeds range from 128 to 1346 r.p.m.; with either a 5 hp. or a 7½-hp. 1800-r.p.m. motor the speed range is from 195 to 2050 r.p.m. With a 7½-hp. 3600-r.p.m. motor a constant spindle speed of 3600 r.p.m. is obtainable. Standard front carriage feeds range from 0.0015 to 0.042 in., and special feeds range from 0.003 to 0.084 in. The capacity of this machine between centers is 18 in.; the swing over the bed is 12 in. and over the front and rear tool-slides, 8 in.



(At left) Improved Toledo heavy-duty press supplied for heavy squeezing, embossing and sizing operations.

(At right) Stub lathe designed to permit efficient application of cutting tools of all types.



OFF THE ASSEMBLY LINE



Motor Car Production Likely to Show Further Shrinkage This Month

DETROIT, Aug. 8.

THE tapering off in automobile production activity, which began in July, continues. The current month's output is likely to show substantial shrinkage. Reliable estimates on July production are difficult because of irregular schedules of most producers. The final figures, however, are expected to show a decrease of around 25 per cent from the June total for United States and Canada of 190,204 cars and trucks. This would indicate July production in the neighborhood of 140,000 units.

Many manufacturers this month are working on smaller schedules, but the extent of the decline in August will depend largely on whether Ford plants close for inventory. Although the matter has been up for consideration, company officials have not yet decided. There is evidence that the Ford company plans to carry on operations at least for another two weeks, so if a temporary suspension comes it will not be until the latter part of the month. That Ford production is being curtailed is indicated by a sharp reduction in shipping releases of suppliers, some of which have been cut more than 50 per cent. One company which supplies Ford with malleable castings has curtailed operations to three days a week from five and a half days.

Increase in Activity Expected in September and October

Local steel mills expect very little business from the motor industry in the next 30 days. In addition to seasonal dullness, the current month is affected by the new model plans of the car manufacturers. For the material suppliers this is an in-between period. Automobile companies planning new models for the fall have just about taken care of their requirements on current lines and as yet have not begun placing orders for their new cars. A considerable increase in activity is expected to develop in September and October.

August output of automobiles probably will be considerably below that of July.

* * *

Ford schedules are being sharply curtailed.

* * *

Motor industry more hopeful than in a long time. Sales of high-priced cars have gained.

* * *

New models may bring increase in activity during September and October.

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In face of declining sales and production, the motor industry is in a more optimistic frame of mind than it has been in a long time. Sales executives are encouraged by the reversal in sentiment of the buying public. They now feel that the wave of ultra-conservatism and fear is broken and that considerable pent-up buying soon will be released. Confidence is not confined to the automobile sales organizations, but extends right through the industry to the material suppliers. Indicative of the new trend, one sales official reported that greater interest in high-priced cars already is apparent and has translated itself into actual orders.

The Chrysler Corp. is understood to have placed a \$5,000,000 contract with the Midland Steel Products Co. for frames. Confirmation is not obtainable, but in motor circles it is believed that this contract covers frames for the new small car which Chrysler is understood to be preparing for introduction this fall. Contrary to expectations, this new small car probably will not bear the Dodge name, but more likely that of one of the other Chrysler divisions.

Buick Motor Co. produced and shipped 2300 cars in July, compared with 3200 in June and 5320 in July, 1931.

Employing more than 8000 men, the Hudson Motor Car Co. is turning out upward of 2000 cars a week, most of which are the new Essex Terraplanes. Shipments of automobiles from the Hudson factories during the last half of July totaled 4261 cars, or the largest for any similar period in more than a year, according to Chester G. Abbott, general sales manager. During the week ended July 23 the company shipped 2711 cars, or the largest number since the week ended May 31, 1930, when 3010 cars were shipped. The largest previous week in 1932 was that ended Jan. 23, when 2000 cars were shipped.

Wayne County Sales of New Cars Show Substantial Decline

New car sales in Wayne County during July showed a substantial decrease from those of the preceding month. July registrations of passenger cars totaled 3508, against 6611 in June and 4440 in July last year. Ford registrations dropped to 2261 from 4119 in June; Chevrolet to 533 from 871; and Plymouth to 275 from 464. Benefiting slightly from the recent introduction of the new Terraplane, which went on sale late in the month, Essex registrations in July ran counter to the trend, increasing to 112 from 92 in June. Approximately two-thirds of the new Fords titled were eight cylinder cars and one-third were fours.

Reflecting the slowing up of industrial activity in this district is the decline in the employment index of the Detroit Board of Commerce, which dropped to 63.4 on July 31 from 69.6 on July 15 and from the peak this year of 72.2 on June 30. The employment situation, however, was still a shade better than a year ago, when the index was 61.8. Confirming this trend, the board's index of electrical power consumption dropped to 114 on July 31 from 131 on June 30 and compared with the year's high of 138.5 on May 31. At the end of July last year this index was 122.

... PERSONALS ...

Roy D. Chapin Becomes Secretary of Commerce

WASHINGTON, Aug. 8.—Roy Dikeman Chapin formally took office as Secretary of Commerce today, succeeding Robert P. Lamont, named as president of the American Iron and Steel Institute. Mr. Chapin's selection was made known by the President on Wednesday of last week at the same time announcement was made of the resignation of Mr. Lamont.

Mr. Chapin was chairman of the board of the Hudson Motor Car Co., Detroit, which position he held since 1923. Previously he was president of the company, having been elected in 1910. He is one of the most widely known men in the automotive industry and has a broad acquaintance through industries and financial institutions of the country. Connected with the automotive industry for almost 30 years, he practically has grown up with it and was associated with many of its pioneers. He has been vice-president of the Lincoln Highway Association, chairman of the Highway Transport Committee of the International Chamber of Commerce and director of the Michigan State Good Roads Association. In 1927 and 1928 he was president of the National Automobile Chamber of Commerce.

♦ ♦ ♦

CHARLES F. STONE, who, as announced in these columns on July 28 had been made president of the Atlantic Steel Co., Atlanta, became identified with the company in 1910 as a salesman. Four years later he was promoted to the post of general manager of sales, in which he has continued since that time. He was elected vice-president in 1920. Mr. Stone was graduated from the Georgia School of

Technology in 1903 and was formerly associated with his father, F. I. Stone, one of the early dealers in steel products in Atlanta.

♦ ♦ ♦

L. A. GRAHAM, who has been engaged in consulting sales work for the Falk Corp. and other engineering manufacturers in the Milwaukee district, has been appointed sales manager of the commercial products division of the Falk Corp. He has had a wide experience in merchandising technical products, having served as sales manager of the Garford Truck Co., Lima, Ohio, and vice-president of Low-Graham-Wallis Co., Inc., Chicago. M. A. CARPENTER, for a number of years in charge of advertising activities of the Falk Corp., has been made manager of the newly created sales promotion department. A. SIMONSON, vice-president, continues in charge of foundry sales.

♦ ♦ ♦

B. L. MAAS, formerly sales manager of the Federal Screw Works, Detroit, has become associated with the Acme Machine Products Co., Muncie, Ind. He will make his headquarters at the company's Detroit offices at 731 Fisher Building.

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CHARLES C. CLUFF, who recently retired as manager of sales for the Carnegie Steel Co. in New York, will start Aug. 12 for a 30-day tour of California and the national parks.

♦ ♦ ♦

CARL P. ALBERT has been elected president and treasurer, Greene Mfg. Co., Racine, Wis., doing a general engineering, metal-working and plating business. He succeeds the late Frederick J. Greene. Mr. Albert became connected with the concern in 1906 as

a mechanic's apprentice. Three years ago he was appointed general manager.

♦ ♦ ♦

HARRY L. HORNING, president, Waukesha Motor Co., Waukesha, Wis., has returned from a European trip of eight weeks. While abroad he arranged to widen the outlet for his company's products, namely industrial gasoline and Diesel engines. These will be made under license by manufacturers in England, and probably in France.

♦ ♦ ♦

E. C. BRANDT, who has been assistant works manager for the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been made manager of renewal parts in all Westinghouse plants. In his new capacity he will have full responsibility for manufacture at Homewood works, Pittsburgh, the coordination of all renewal parts manufacture, expansion of renewal parts business, coordination of headquarters and district sales, service department renewal parts activities, engineering effort, stocks and servicing.

Urges Bank Credits for Gathering of Scrap

Seventy-five thousand people could be restored to employment in the scrap iron and steel industry if bank credits needed by the industry, estimated at \$15,000,000, could be made immediately available, according to Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, who has submitted this statement to Charles A. Miller, president, Reconstruction Finance Corporation, and to Eugene Meyer, governor of the Federal Reserve Board.

These funds, according to a survey made by Mr. Schwartz, are needed to enable the scrap iron dealers to maintain approximately 1,000,000 tons of scrap iron and steel in their yards, as a reservoir of raw materials for the steel industry, as well as to enable them to purchase available tonnage of scrap now offered on the market, for which there are few bidders because of restricted bank credit.

During the past few months a large percentage of the scrap now held by dealers has become "distress" tonnage, having been sold at sacrifice prices, in order to enable the dealers to meet their bank and operating obligations. Mr. Schwartz also stated that there are approximately 500,000 tons of scrap iron owned by railroads, which cannot be moved to the scrap yards of the country, where some of it would normally go, until bank credits are made available. The sale of this tonnage of scrap by the railroads, it was stated, would bring a large cash revenue to the railroads with which to buy new equipment and would also net the railroads an appreciable freight revenue.



R. D. CHAPIN



C. F. STONE



L. A. GRAHAM

Federal Departments Required by Law to Buy U. S. Goods

Comptroller General Rules That Bill Enacted July 5, 1932, Gives
No Choice Unless Price Is Unreasonable

WASHINGTON, Aug. 9.—Important Government departments are compelled under the law to purchase American products, according to a comprehensive decision by Comptroller General J. R. McCarl. The departments coming under the law have no other choice, assuming the cost of the domestic products "be not unreasonable." Contractors and subcontractors doing Government work must supply domestic material where possible and when they are not excessive in cost.

In this broad ruling, the Comptroller General sweeps aside all fineness of language and phraseology which beset Congress and caused Senator Reed of Pennsylvania to attempt unsuccessfully an amendment to overcome what was apparently an obstacle to the exclusive purchase of domestic products from the raw to the finished materials.

The finding of Mr. McCarl was asked by Secretary of the Treasury Mills. It is understood that it was requested partially because of an uncertainty as to whether award should be made for some wire rope and other supplies. The Secretary of the Treasury asked for interpretation of the section of the Treasury-Post Office Department law enacted July 5, 1932, relating to purchases of supplies to be contracted for through the General Supplies Committee for furnishing supplies during the fiscal year 1933. This section provides that only articles grown, produced or manufactured within the limits of the United States shall be purchased or contracted for. Similar provisions are carried in the Army, Navy and independent offices' bills, covering such Government establishments as the Veterans' Bureau and the Shipping Board, which, like the War, Navy, Post Office and Treasury departments, are important buyers directly or through contract of iron and steel and metal-working machinery.

Decision Affects Government Buying

The decision therefore applies to practically all the major Government branches which use iron and steel and machinery. It apparently upsets the action of Postmaster General Brown in recently making an award to a domestic interest for jute twine, the raw material coming from abroad to be finished in this country. The contention was that the material must be grown, produced or manufactured in the United States, the conjunction being interpreted to mean that it was within the spirit of the law to make

the award if the raw material originated abroad, but was manufactured in the United States. It is understood that the Postmaster General will be asked to rescind the order and place the award for cotton twine, the cotton being a United States product.

The Comptroller General plainly advised Secretary Mills that where the appropriations of a department or establishment are subject to the provision mentioned, "its orders or requisitions under General Supply Committee contracts should contain a notice to the contractor to the effect that the order or requisition is not to be filled unless the article to be furnished is of the growth, production or manufacture of the United States."

The opinion proceeded to say that if the question of excessive cost of the domestic article is raised the matter should be submitted to the Comptroller General for decision before award is made. This will deprive any department or establishment of the Government from rejecting a domestic product on the ground that the cost is unreasonable unless its position is first approved by the Comptroller General.

Where awards for foreign articles were made under appropriation acts carrying the section, it will be necessary to cancel the contracts and apply them to domestic products, provided the "excess of the cost be not unreasonable." New bids will be required. The Comptroller General made this finding in response to the statement by Secretary Mills that prior to the passage of the current Treasury-Post Office Department act bids had been advertised for and contracts had been awarded for furnishing the items of supply in the general schedule of supplies. Among those items, the Secretary said, are some articles of foreign origin.

The decision of the Comptroller General was asked as to whether this and other acts containing similar provisions would preclude the purchase of articles already contracted for. It was stated by Secretary Mills that if the Comptroller General's decision was in the affirmative the Treasury Department would like to know the procedure that should be followed. He asked whether new bids should be obtained for these items or whether recourse may be had to those previously received that may offer articles of the growth, production or manufacture of the United States.

"All contracts entered into by the

Treasury Department under the General Supply Committee statutes must conform to the terms of the law applicable for the fiscal year in which such contracts are to be effective, and you are advised that articles not of the growth, production or manufacture of the United States cannot be charged to appropriations containing provisions similar to the extract herein quoted ('domestic products' provision) from the act of July 5, 1932, or to the permanent provisions of the act of March 8, 1932, applicable to the War Department, unless the excess cost of the articles of the growth, production, or manufacture of the United States be unreasonable," the Comptroller General said. "In other words, articles not of the growth, production or manufacture of the United States may not be purchased unless they come within the exception stated in the law, and you are advised that recourse may not be had to proposals previously received from bidders offering articles of the growth, production or manufacture of the United States when the foreign articles were accepted. It will be necessary to re-advertise for proposals for furnishing these articles and then to determine whether the difference in cost be reasonable or unreasonable and whether the interest of the Government will not permit the purchase or contracting for domestic articles. If in any case it should be believed that the excess cost of the domestic article is unreasonable, the matter should be submitted here for decision before award is made of the contract."

Fabricated Plate Orders Gained in June

WASHINGTON, Aug. 8.—Bookings of fabricated steel plate in June totaled 14,313 tons, according to data reported to the Bureau of the Census by 51 fabricators. Orders in May were 11,788 tons while in June, 1931, they amounted to 28,806 tons. Bookings for the first six months of the current year were 88,107 tons, contrasted with 161,944 tons in the same period last year and 263,438 tons in the first half of 1930.

Cleveland Companies Are Consolidated

The Consolidated Iron-Steel Mfg. Co., Cleveland, has been incorporated to succeed the Consolidated Iron & Steel Co. and has acquired the Republic Structural Iron Works, the Taylor & Roggis Foundry, the Duplex Hanger Co. and the Cleveland Lock Works. These companies will continue under their old names and personnel. I. T. Kahn, president, and Joseph Lehman, secretary, of the former Consolidated company, will hold similar offices with the new organization.

Railroad Rehabilitation Plan Would Stimulate Business

Executives of Carriers Considering Action—Bad Order Freight Cars Increasing, Though Retirements Are Small

THE American Association of Railway Executives, at a meeting in New York this week, will consider plans that have been proposed for a railroad rehabilitation program as a contribution to employment relief. President Hoover, in a recent official statement, mentioned that preliminary conferences had been held to discuss such a program.

In an address delivered by radio over station KDKA at Pittsburgh on Sunday evening, W. S. Rugg, vice-president of the Westinghouse Electric & Mfg. Co., advocated wide use of funds by the Reconstruction Finance Corporation to rehabilitate the country's transportation facilities and stated that such action would do more to stimulate general business than any other activity.

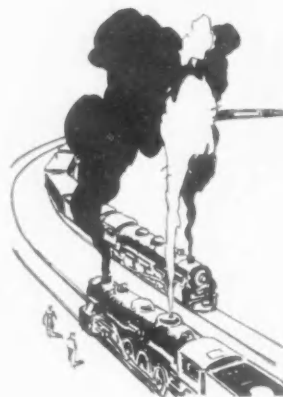
Would Have Bracing Effect

"Any increase in railway purchases," said Mr. Rugg, "is bound to have a bracing effect on industry as a whole."

In an editorial on the subject of Government financing of railroad purchases, *Railway Age* says:

If it is worth while, as a means of helping revive prosperity, for the Government to invest hundreds of millions of dollars in public works, from which it will never recover a penny of either interest or principal, upon what grounds of economics or public policy can it be contended that it should not, for the purpose of stimulating business, loan to the railways money the principal of which it will get back? Certainly, if railway managements are willing, in an effort to promote the public welfare, to defy every sound principle of business and accounting by using borrowed money to pay operating expenses, and to take all the risks that thus increasing their indebtedness to the Government will involve, then the Government, in the public interest, should be willing to loan them the money without subjecting them to the extra cost of paying interest upon it.

The railways thus far in 1932 have reduced their maintenance expenditures 48 per cent, or at the rate of almost one billion dollars a year as compared with 1929, and 43 per cent, or at the annual rate of 750 million dollars, as compared with 1930. They employ labor and make purchases in every section, and consequently the adverse effects on business of the reductions of their maintenance expenditures have ramified into every section and community. They are not only directly large employers of labor in carrying on their normal maintenance work, but are among the very largest purchasers of iron, steel, lumber and innumerable finished products and raw materials, and



therefore indirectly very large employers of labor. As the reductions of their employment and purchases for maintenance purposes have helped to spread disaster throughout the country, so a substantial increase in their expenditures for these purposes probably would be a potent influence for a revival of general business.

Large Increases in Bad Order Cars

A private survey of present freight car equipment shows that there have been large increases in bad order cars which will eventually need replacing or rebuilding. Forty-three of the Class 1 railroads which own 1,442,042 revenue freight cars, or 64.5 per cent of the 2,205,065 owned by all roads, replied to a questionnaire on the condition of their equipment.

Fifteen roads reported having no definite plans for retiring obsolete equipment, although four of these 15 are owners of more than 60,000 cars. The reason given for this absence of policy is mainly uncertainty as to the future, though it is also admitted that possible heavy charge-offs, if a large number of cars are destroyed, is a factor in keeping obsolete equipment on the retirement list.

Some railroads have cars on the retired list with no plans for scrapping them this year. These cars are stored away awaiting better times so that expense and charge-offs can be taken care of without seriously affecting earnings statements.

As a result of this survey, it is estimated that a total of more than 500,000 of existing revenue freight cars will be out of service by 1936. Two or three of the larger roads contemplate scrapping up to 29 per cent of their present equipment by 1936. The average of other roads which have re-

tirement programs is 23.5 per cent out of service by 1936.

Reduction of 100,000 Since 1929

It is also pointed out that there has been a reduction of more than 100,000 freight cars since Jan. 1, 1929. The cars on the present retirement list, it is stated, are not all in bad order, but many of them have such a low maintenance limit that few will be available for service very long under normal traffic conditions.

A pick-up in business would, it is asserted, cause a car shortage, as with 500,000 cars on the retirement list and a reduction in ownership of more than 100,000 since Jan. 1, 1929, the railroads have a very small surplus of equipment for the low tonnage now being hauled. This is borne out, it is said, by reports of delays in shipments owing to cars getting in bad order, which delays would not be so frequent if good cars were always available.

Favorable Factors for Car Buying

Among the factors held to be favorable for a resumption of railroad equipment buying are these:

There have been generally no heavy repairs or rebuilding of cars in any quantity for two years, and repair parts orders have been steadily declining to the vanishing point. This section of car business will increase quickly with any upturn in traffic.

There are still 250,000 wood cars in service that are being looked upon with more and more disfavor by carriers. These cars make up a large proportion of the equipment that will be retired by 1936.

The car builders and the American Railway Association car committee have designed a new all-steel box car which has many advantages over the A. R. A. former designs, being lighter in weight, stronger and of greater cubic capacity than the old cars. While the new car has not yet been officially adopted, it probably soon will be. The advantages of this new car, it is held, will spur retirements of obsolete box cars.

There are several hundred thousand freight cars with arch bar trucks which will not be accepted in interchange between roads after 1936. Many of these old cars will be scrapped as they are largely of obsolete design, low capacity and have high maintenance cost.

Federal and State regulation and taxation of trucks will throw back to the railroads much of the traffic that has been lost to motor transportation, increasing the railroad tonnage and making rehabilitation of much freight equipment imperative.

Orders for steel boilers in June, based on reports submitted to the Bureau of the Census by 72 manufacturers, totaled 328, compared with 265 in May and 788 in June, 1931. Similar orders in the first six months of this year aggregated 1582, contrasted with 3709 in the first half of 1931.

Robert P. Lamont to Become President of American Iron and Steel Institute

ROBERT P. LAMONT, who resigned the position of Secretary of Commerce on Aug. 3, will be elected president of the American Iron and Steel Institute at a meeting of its directors on Aug. 18. The announcement of the selection of Mr. Lamont for this important position was made at the office of Charles M. Schwab, 25 Broadway, New York, the day after the publication of Mr. Lamont's resignation from President Hoover's Cabinet.

Mr. Schwab will retire from the position of president of the institute, to which he was elected as a successor to the late Judge E. H. Gary. While no announcement has been made as to the part that Mr. Schwab will take in future counsels of the institute, it is understood that a position of chairman may be created, to which Mr. Schwab will be elected, but the brunt of the work in carrying out the enlarged program of the institute will fall to Mr. Lamont.

In his address to the institute at its May meeting, Mr. Schwab referred briefly to the decision of the directors to broaden the scope of the organization, but gave no details of the plans that may have been formulated. The scope of the new work is such, however, that the directors recognized the necessity of selecting a man who could give his full time to the coordination of the broadened activities. It was also decided that the new president should come from outside the steel industry. Although Mr. Lamont was for many years president of American Steel Foundries, Inc., which manufactures steel castings, he has not been identified with the rolled steel branch of the industry. However, in selecting Mr. Lamont, the institute has picked a man who is well known to the iron and steel industry and one who knows the iron and steel industry and its problems.

Has Broad Background

His wide range of interests as a business man and engineer and his recent work as Secretary of Commerce give him a broad background far beyond any single line of endeavor. He also brings to the iron and steel industry a close understanding of the relationship between the Government and industry as a result of having been in charge of the Federal department most closely connected with

Myron C. Taylor Approves Institute Expansion

MYRON C. Taylor, chairman, United States Steel Corp., said regarding Mr. Lamont's selection:

"In my opinion the plan for expansion of the executive personnel of the institute is decidedly progressive. The institute under such leadership as is combined in Mr. Schwab and Mr. Lamont should prove increasingly successful in its activities."

business affairs. Mr. Lamont has not only had a close-up view of industry's problems, but at the same time he has obtained an intimate comprehension of the Government's attitude toward



ROBERT P. LAMONT

business. This knowledge will no doubt be an important factor in his new work.

Born in Detroit, Dec. 1, 1867, Mr. Lamont was graduated as a civil engineer from the University of Michigan in 1891. His initial job of importance was engineering construction of buildings at the Chicago World's Fair in 1893.

Making a quick rise in business in the Middle West, Mr. Lamont was made first vice-president of the Simplex Railway Appliance Co. in 1897. In 1912 he was elected president of American Steel Foundries, Inc. He was also chairman of the Griffin Wheel Co. He became a director in a number of outstanding companies, including the International Harvester Co., the Baldwin Locomotive Co., Montgomery, Ward & Co., Armour & Co., the American Radiator Co., the First National Bank of Chicago, the Illinois Bell Telephone Co. and the Chicago Daily News Co. He severed all business connection upon entering the Hoover Cabinet. His selection as Secretary of Commerce was as much of a surprise to him as it was to the country generally, for Mr. Lamont was unknown in the political field and never took any professional interest in it. Evidence that his appointment was a surprise to Mr. Lamont is given by the fact that he was made a director of the Baldwin company only a few days before he was appointed Secretary of Commerce.

Had Met Hoover Only Once

The acquaintance of Mr. Hoover and Mr. Lamont was slight. They had met only once before, though during the war they had worked within a few blocks of each other in Washington, Mr. Hoover as Food Administrator and Mr. Lamont as head of the Procurement Division of the War Department.

Lamont Was Large War Buyer of Steel

As head of the Procurement Division, with the rank of colonel, Mr. Lamont became well known to the steel industry. He was by far the heaviest buyer of steel the country has ever seen. For in his capacity he was responsible for the placing of contracts for ordnance totaling more than \$8,000,000,000.

OBITUARY

FREDERICK W. SINRAM, president, Gears & Forgings, Inc., Cleveland, and long a prominent leader in the gear-making industry and in the American Gear Manufacturers' Association, died Aug. 2, after a long illness, aged 51 years. One of the organizers of the Gear Manufacturers' Association, he was elected its first president in 1917 and served continuously until 1923, when he felt it necessary to decline reelection. On his retirement as active head he was elected honorary president for life. He played a conspicuous part in laying out the program of the gear association, which included such important work as improvement in quality and standardization of gear design, manufacture and application, and rendered much assistance in the association research work. He served as chairman of the War Service Committee of the gear industry and started the work of gear standardization in accordance with Mr. Hoover's gear standardization program.

Mr. Sinram was born in Cleveland, where he received his public school education. Later he studied law, was admitted to the bar and held the degree of LL.B. from Baldwin-Wallace College, Berea, Ohio. He early showed his ability in organization work and was one of the founders of the Delta

Theta Phi fraternity. His first business affiliation was with the Van Dorn & Dutton Co., Cleveland gear manufacturer, of which he became secretary in 1910. He became vice-president of that company in 1918 and later its president. When Gears & Forgings, Inc., was formed by the merger in 1928 of several gear and forging manufacturers, including the Van Dorn & Dutton Co., Mr. Sinram became president of the new organization.

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PHILIP A. MYERS, president, F. E. Myers & Brothers Co., Ashland, Ohio, manufacturer of pumps, died Aug. 5 as the result of injuries sustained several weeks ago in an automobile accident. He became head of the company after the death of his brother, F. E. Myers, several years ago. He was director and vice-president of the First National Bank in Ashland, director of the Union Trust Co., Cleveland, president of the Chase Foundry & Mfg. Co., Columbus, and a trustee of Ashland College.

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ROBERT W. MACKIE, president, Oshkosh Motor Trucks, Inc., successor to Oshkosh Four Wheel Drive Co., Oshkosh, Wis., died Aug. 3, aged 80 years.



F. W. SINRAM

He was at one time owner of the Mackie & Kossel Mfg. Co., and of the former Davis Threshing Machine Co., Oshkosh.

♦ ♦ ♦

WILLIAM ROWAN, JR., who was identified for many years in an executive capacity with the Morton Mfg. Co., Muskegon Heights, Mich., died on June 13.

Valley Interests to Oppose Adverse Canalization Report

YOUNGSTOWN, Aug. 9.—Iron and steel companies and civic organizations in the Valleys have already taken steps to protest against the unfavorable recommendations on the canalization of Beaver, Mahoning and Shenango rivers which were made public last week by Col. George R. Spalding, United States division engineer in charge of the upper Mississippi Valley. The report followed a two-year survey of the proposed project which was authorized by Congress July 3, 1930.

"The principal grounds upon which the adverse conclusions are based," according to Colonel Spalding, "are that the unfavorable natural characteristics of the upper Beaver, Shenango and Mahoning rivers (restricted widths due to concentration of rail facilities and encroachment of industry; meager water supply, and the complexity and magnitude of necessary bridge alterations) impose physical limitations upon their improvement and that the resulting waterway system would be inadequate to carry sufficient commerce in a manner

to make the savings necessary to justify the large capital outlay and large operating costs involved."

It is pointed out that the report considers only the canalization of the three rivers mentioned and in no way involves the proposed Lake Erie-Ohio River canal which is actively sought by both Valley and Pittsburgh manufacturing interests. Nevertheless the tri-river canalization is of more immediate importance to Valley shippers, as it would provide lower fuel costs as well as an outlet for finished products to the Mississippi Valley.

Valley interests based their hopes for reconsideration of report on Colonel Spalding's statement that interested parties still have the privilege of an appeal from the conclusions to the Board of Engineers for Rivers and Harbors, a permanent body at Washington, to which all examinations and survey reports of this character are referred. It is not unlikely that such an appeal will be made by the Beaver, Mahoning and Shenango Rivers Improvement Association,

which is headed by T. J. Bray of Youngstown.

At a meeting of Youngstown and other Valley shippers held on Aug. 5 in the office of Frank Purnell, president, Youngstown Sheet & Tube Co., it was decided to send engineers to Pittsburgh for a detailed study of the report. Such reports are not ordinarily made public until after they are printed and published by Congress, but it is believed that permission for a confidential perusal of these findings may be obtained by the interested parties from the War Department.

While the developments of the last week were distinctly disappointing to Valley industrial leaders, the situation will be carefully reviewed from all angles and action taken slowly. If it is found that the canalization project is not feasible, Youngstown shippers wish to know finally in order that relief may be sought from other sources. It is pointed out that negotiations already conducted have brought some help from the railroads in the form of lower freight rates on coal.

Babcock & Wilcox Co., 85 Liberty Street, New York, will concentrate its purchasing at the Barberton, Ohio, Works after Sept. 1.

• • EDITORIAL COMMENT • •

New Leadership In Steel

ROBERT P. LAMONT'S election as president of the American Iron and Steel Institute means much more than the steel industry's acquisition of an important figure in the Federal Administration. It may well prove to be the most significant step the industry has taken in the 24 years of Institute history. The daily press heralds Mr. Lamont's new role as that of a dictator who will aid the manufacturers in "the adoption of a more aggressive policy of cooperation to overcome unsettled conditions in the steel industry." Neither Mr. Lamont nor the directors of the Institute, it is safe to say, think of his new functions in terms of a dictatorship. Yet, in the parlance of the time, that word probably describes in part the leadership for which the steel trade is ready, in view of its disastrous experiences of many months.

Mr. Schwab, who now becomes chairman of the Institute, has been actively forwarding this enlargement of its work. At the New York meeting in May he spoke with satisfaction of the recent decision of the directors to broaden its scope, "to have a more invigorated policy and to extend our facilities for presenting a unified front for our industry."

Naturally, in view of the constant preachments on price-cutting in the long succession of Judge Gary's presidential addresses and in most of those of President Schwab in these last four years, the help Mr. Lamont can give in correcting market weaknesses is stressed in current comment on his future work. Stabilization, regularization, rationalization, all are made use of to describe the approach to price maintenance the new regime must realize if steel making is again to be carried on at a profit.

It hardly need be said that Mr. Lamont could not have been attracted to his new career had the steel men pictured it in terms of a glorified pool commissionership. Equally certain is it that the leaders of the steel industry plan no step that would contravene the letter or the spirit of existing laws. Mr. Lamont, while formerly the head of a large steel casting corporation, comes to the rolled steel industry as an arbiter from without. That detachment will count much for his influence. His exceptional talent for business and his years of leadership in the Federal Government's advancement of our commerce and industry are full of promise for the Institute's new program.

That there is a program is a fair assumption, though its extent has not been officially indicated. New uses for steel, as has long been urged, can be developed by united effort. Fundamental research in production and distribution can be carried on cooperatively. Excess capacity can be prevented, should that threat come again. Sound market practices can be established by the sanctions of producers willing to take the long look as against the advantage of the moment. No doubt, also, the steel producers will carry further their campaign against the dumping of foreign steel.

In these and other ways the larger place that cooperative effort must take in the post-depression period will be demonstrated. It may indeed appear in time that steel, for so long a laggard, has reestablished its leadership in showing what economic planning by a whole industry can do for all in it, in hastening recovery from a devastating depression.

Federal Departments Must Buy Home Products

PRODUCTS capable of being "grown, produced or manufactured" in the United States, must be bought by the Treasury and Post Office Departments, unless their prices are "unreasonable," according to a ruling by the Comptroller General on July 5. Excess cost of home products will not necessarily constitute unreasonableness and ruling on this point will be made individually by the Comptroller General's office.

Details of this important ruling are given in the news columns of this issue. Cynics might remark that this is an illustration of how much faster we can proceed with Congress adjourned. For Senator Reed of Pennsylvania labored unsuccessfully to accomplish the same end by amendment of the R. F. C. bill.

Gray Iron Can Not Be Downed

PREDICTIONS were rife only a few years ago that the gray iron industry had seen its best days and that new products in alloy steels, in stampings and in welded materials would ultimately displace this well-known and long-used product. At that time there seemed to be some justification for such prophecies. But metallurgical research in the improvement of the cupola melting process itself, the use of the electric furnace and the addition of alloys have completely changed the picture. Today gray iron without alloys can be produced having physical and other properties thought impossible not so long ago. This has been brought about by the use and regulation of higher temperatures in melting and by the character of the charge in the cupola or in the electric furnace. By the addition of alloying elements it has also been found possible to so change the structure and properties of gray iron that a product is now being commercially made which in many respects approaches steel and other cast materials. In all this heat treatment has been an important factor. An outstanding example of this was described in *THE IRON AGE* of Aug. 4—an alloy iron of high tensile and wearing properties developed by a leading builder of machine tools to meet special conditions. It is convincingly evident from this and many other examples that high-test or alloy gray iron has many possibilities and that these have only begun to be fully developed.

Steel Ingot Output in July Touches Another New Low

Daily Rate Only 31,701 Tons, Smallest Since January, 1904—
Percentage Rate Drops to 14.66

STEEL ingot output again declined in July. The daily average of 31,701 gross tons was a little more than 8 per cent below the 34,511-ton figure for June. Total output in July, which had 25 working days, was 792,533 tons, compared with 897,275 tons in June, which had one more working day. The percentage rate of production in July was 14.66, against 15.96 in June, based on the estimated annual capacity of 67,473,630 tons of open-hearth and Bessemer ingots. The July daily rate was the smallest since January, 1904.

Bessemer output made a slight gain in July—102,872 tons, against 100,249 tons for June—but open-hearth output fell off about 13.5 per cent.

July production was at a rate of less than 10,000,000 tons a year. No full year's production since 1900 has been that low. The output for seven months of this year totals only 8,360,320 tons, which is 9,087,138 tons, or about 52 per cent, below that of the corresponding period in 1931.

Barring a slight improvement in January and February of this year

and a little gain in November of last year, the trend of ingot production has been downward since March, 1931.

Coast Projects Expected to Get R. F. C. Support

SAN FRANCISCO, Aug. 5.—Major public projects on the Pacific Coast which seem most likely to receive favorable consideration from the Reconstruction Finance Corporation as self-liquidating utilities include the \$35,000,000 Golden Gate Bridge and \$75,000,000 Trans-Bay Bridge at San Francisco, the \$3,500,000 Skagit municipal hydroelectric development at Seattle and the Colorado River-Metropolitan Water District canal project in southern California. Of these the San Francisco Trans-Bay Bridge is perhaps most likely to get first consideration, since plan. are complete. Federal engineering approval has been received and the State of California is fathering the project as part of the

State highway system. It is announced that a call for provisional bids may be expected shortly for the five west piers, involving over 800 tons of steel and estimated to cost \$8,000,000.

Six companies, contractors for Hoover Dam, let contracts during the past week for five 20-ton cableways, involving 800 to 1000 tons of shapes for towers, to the Consolidated Steel Co. and over 100 tons of 3-in. cable to the American Steel & Wire Co. through the Columbia Steel Co. The city of San Francisco awarded to its own public utility department the contract for completion of the Hetch-Hetchy water project, involving approximately 2000 tons of bars, shapes and plates, which will probably be bought in small quantities as required.

Optimism continues to increase, in spite of delayed acceleration in tonnage. Inquiries through jobbers are increasing, the local market is continually firmer in price quotations, and stocks, except in the case of pipe for the oil industry, have been fairly well cleaned up.

During the past week awards of approximately 1800 tons were reported on major structural projects, with new tonnage entered as pending approaching 2500 tons.

Chicago Shippers Oppose Rise in Switching Rates

Sixty of the foremost shippers in the Chicago district have filed with the Interstate Commerce Commission formal objections to the higher rates recently imposed on interstate traffic in the Chicago switching district. Switching rates in the Chicago district, the shippers state, are now higher than comparable rates in other major shipping centers.

They contend that the recent increases authorized by the commission were based on an out of date survey made in 1927. Opposition is also developing to the proposed raising of intrastate switching rates to the level of the interstate rates.

Among the companies filing these objections are Acme Steel Co., Youngstown Sheet & Tube Co., Interlake Iron Corp. and Chicago Coal & Dock Co.

Alco Products, Inc., division of the American Locomotive Co., has received an order from the Kendall Oil Co., Bradford, Pa., for a complete vacuum distillation plant for the manufacture of special grades of automobile lubricants. The plant will adjoin another unit that was installed by Alco about a year ago. It will be fabricated at the plant of the American Locomotive Co., Dunkirk, N. Y.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS (Gross Tons)

Reported by Companies Which Made 95.33 Per Cent of 1930 Ingots						
1931	Open-Hearth	Bessemer	Calculated Output All Companies		No. of Working Days	Per Cent Operation
			Monthly	Daily		
January	2,098,175*	296,626	2,512,110**	93,042**	27	43.86**
February	2,131,079*	296,974	2,547,027**	106,126**	24	49.96**
March	2,565,531*	346,137	3,054,339**	117,475**	26	55.30**
April	2,321,043*	316,668	2,766,959**	106,421**	26	50.09**
May	2,130,805*	301,639	2,551,633**	98,140**	26	46.20**
June	1,782,007*	246,365	2,127,762**	81,837**	26	38.52**
Six Months	13,028,640*	1,804,403	15,559,866**	100,386**	155	47.25**
July	1,574,375*	225,030	1,887,586**	72,559**	26	34.17**
August	1,462,254*	174,380	1,716,829**	66,032**	26	31.08**
September	1,274,072*	199,151	1,545,411**	59,439**	26	27.98**
October	1,319,958*	195,943	1,590,180**	58,896**	27	27.72**
November	1,276,856*	240,441	1,591,614**	63,666**	25	29.97**
December	1,068,384*	172,046*	1,301,211**	50,047**	26	23.56**
Total	21,004,543*	3,011,394*	25,192,715**	81,006**	311	38.13**

*Revised. **Adjusted.

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1930, of 66,069,570 gross tons for Bessemer and open-hearth steel ingots.

Reported for 1932 by Companies Which Made 95.33 Per Cent of the Open-Hearth and Bessemer Steel Ingot Production in 1931

1932	Open-Hearth	Bessemer	Calculated		No. of Working Days	Per Cent Operation
			Output All Companies			
			Monthly	Daily		
January	1,230,661	160,633	1,459,450*	56,133*	26	25.96*
February	1,232,568	157,067	1,457,710*	58,308*	25	26.96*
March	1,149,307	193,944	1,409,054*	52,187*	27	24.13*
April	1,036,227	144,197	1,238,250*	47,625*	26	22.02*
May	950,785	103,593	1,106,930*	42,540*	26	19.67*
June	755,123	100,249	897,275	34,511	26	15.96
July	652,650	102,872	792,533	31,701	25	14.66
Seven Months...	7,007,321	962,555	8,360,320	46,190	181	21.36

*Revised.

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1931, of 67,473,630 gross tons for Bessemer and open-hearth steel ingots.

SUMMARY OF THE WEEK'S BUSINESS

Business Lags But Prices Gain Strength; Scrap Higher at Pittsburgh and Chicago

Inquiries for Steel and Pig Iron Improve Slightly—Ingot Output
Lower at 14 Per Cent—Railroad Buying Expected

A SHARP rise in scrap prices at Chicago and Pittsburgh, strengthening of the non-ferrous metal markets, a slight increase in consumer interest in steel and pig iron and an actual expansion in demand for wire products from agricultural areas are straws of betterment that are being closely watched as possible forerunners of an upturn in the steel and allied metal-working industries.

There has been no abatement of confidence among iron and steel producers that next month will bring more definite signs of improvement. Little change is expected during August, and in fact the aggregate results of the past week as to volume of business have been disappointingly small, resulting in a further drop in steel ingot output to about 14 per cent from 15 per cent last week. Chicago district steel plants are operating at well under 10 per cent, but a resumption there this week of a Steel Corporation unit will bring the rate up to 12 or 13 per cent. At Cleveland, a steel plant which depends largely upon automobile business has shut down its open-hearth department, bringing the rate for that district down to 12 per cent. Elsewhere, operations are virtually unchanged, though sheet and strip mills are feeling the effects of the almost complete absence of buying by the automobile industry.

Hopefulness as to the future is being buoyed up by the rise in prices in security and commodity markets, the efforts being made toward credit expansion and plans for extension of loans by the Reconstruction Finance Corporation for building projects and rehabilitation of railroad equipment. Although the marked rise in securities has been viewed with some apprehension in business circles which see no immediate change in their situation to support it, there is a realization that the higher levels will tend to lift the burden of debts and that reduced indebtedness will make itself felt in freer buying of commodities.

SCRAP markets, which sometimes anticipate an upturn in steel production by at least a few weeks, have developed a strong undertone. Advances of 50c. to \$1 a ton have occurred at Chicago on several grades, while the Pittsburgh quotation on heavy melting steel is 50c. a ton higher. A mill in that district paid \$1 a ton above the price ruling on the last previous mill purchase. The scrap trade expects still higher prices. At Chicago, offers of \$6 a ton, on dock, for heavy melting steel for shipment to a Canadian mill have been refused in some instances, though this price is fully \$1 a ton above that recently paid by mills in that district. At Pittsburgh, brokers are paying \$8.25 to fill an order

taken at \$8. THE IRON AGE composite price for scrap has risen to \$6.83, the highest since June 21, when the figure was the same.

Pig iron has responded somewhat to the improved outlook. In the Cleveland district a few melters have sought to cover their anticipated requirements for the remainder of the year, a changed situation as there has been very little forward buying of late. Some Chicago district consumers are taking more iron, not because their melt has increased but presumably to have it on the ground in preparation for fall business.

AMONG the larger consumers of iron and steel, the railroads are expected to be the first to increase their commitments in an important way. At present they are ordering steel no more freely, but there is widespread conviction that new equipment and repair programs will soon be inaugurated. Repairs have been neglected, resulting in a considerable increase in bad order cars. A shortage of certain types of grain cars probably would occur in the West if crop movements increase even to a moderate extent. A survey of equipment of Western roads shows that a third of all freight cars are more than 20 years old. Some existing cars are in too poor a condition to warrant expenditures for repairs.

Many large construction projects are in the formative stage, but most of them are dependent upon financing by the Reconstruction Finance Corporation, and progress to the stage where steel will be needed will necessarily be slow. Actual work probably will not be started in most instances until fall. Structural steel lettings the past week were only 12,100 tons, but new inquiries call for 25,900 tons, of which 15,000 tons is for a World's Fair tower at Chicago.

The slowing down in the automobile industry has been the principal unfavorable development as affecting demand for steel, but there has also been a decline in tin plate output to about 35 per cent, with some makers not doing that well. Farm implement manufacturers, though encouraged by the rise in prices of farm products, are either not operating at all or at very low rates, and steel buying from that source is very light, but fall production programs to be started within a month or two will bring an increase.

STEEL ingot output in July made another new low record, the daily rate of 31,701 gross tons having been the smallest in any month since January, 1904. The decline from June, figured on the daily output, was 8 per cent. The percentage rate of production last month was 14.66 against 15.96 in June.

▲ ▲ ▲ A Comparison of Prices ▲ ▲ ▲

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Aug. 9, 1932	Aug. 2, 1932	July 12, 1932	Aug. 11, 1931
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	\$14.34	\$14.34	\$14.34	\$16.76
No. 2, Valley furnace.....	14.50	14.50	14.50	17.00
No. 2 Southern, Cin'tl.....	13.82	13.82	13.82	14.69
No. 2, Birmingham.....	11.00	11.00	11.00	12.00
No. 2 foundry, Chicago*.....	15.50	15.50	15.50	17.50
Basic, del'd eastern Pa.....	14.50	14.50	15.50	16.75
Basic, Valley furnace.....	13.50	13.50	13.50	15.50
Valley Bessemer, del'd P'gh.....	16.89	16.89	16.89	18.76
Malleable, Chicago*.....	15.50	15.50	15.50	17.50
Malleable, Valley.....	14.50	14.50	14.50	17.00
L. S. charcoal, Chicago.....	23.17	23.17	23.17	25.04
Perromanganese, seab'd car- lots.....	68.00	68.00	68.00	85.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel

	Aug. 9, 1932	Aug. 2, 1932	July 12, 1932	Aug. 11, 1931
<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.20	2.20	2.20	2.40
Hot-rolled annealed sheets, No. 24, Chicago dist. mill.....	2.30	2.30	2.30	2.50
Sheets, galv., No. 24, P'gh.....	2.85	2.85	2.85	2.90
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	3.00
Hot-rolled sheets, No. 10, P'gh.....	1.55	1.55	1.55	1.70
Hot-rolled sheets, No. 10, Chi- cago dist. mill.....	1.65	1.65	1.65	1.80
Wire nails, Pittsburgh.....	1.95	1.95	1.95	1.90
Wire nails, Chicago dist. mill.....	2.00	2.00	2.00	1.95
Plain wire, Pittsburgh.....	2.20	2.20	2.20	2.20
Plain wire, Chicago dist. mill.....	2.25	2.25	2.25	2.25
Barbed wire, galv., P'gh.....	2.60	2.60	2.60	2.55
Barbed wire, galv., Chicago dist. mill.....	2.65	2.65	2.65	2.60
Tin plate, 100 lb. box, P'gh.....	\$4.75	\$4.75	\$4.75	\$5.00

Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	32.00	32.00	32.00	34.00
Rerolling billets, Pittsburgh.....	26.00	26.00	26.00	29.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	29.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	29.00
Forging billets, Pittsburgh.....	33.00	33.00	33.00	35.00
Wire rods, Pittsburgh.....	37.00	37.00	37.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.....	1.60	1.60	1.60	1.60

Old Material

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh.....	\$8.50	\$8.00	\$8.25	\$10.75
Heavy melting steel, Phila.....	6.25	6.25	6.25	8.75
Heavy melting steel, Ch'go.....	5.75	5.25	4.75	8.25
Carwheels, Chicago.....	6.00	5.50	5.50	10.00
Carwheels, Philadelphia.....	8.50	8.00	8.00	12.00
No. 1 cast, Pittsburgh.....	9.50	9.50	9.50	11.00
No. 1 cast, Philadelphia.....	8.00	8.00	8.00	11.50
No. 1 cast, Ch'go (net ton).....	6.00	6.00	6.00	9.00
No. 1 RR. wrot., Phila.....	8.50	8.50	8.50	10.00
No. 1 RR. wrot., Ch'go (net).....	3.75	3.75	3.75	7.00

Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$2.00	\$2.00	\$2.00	\$2.40
Foundry coke, prompt.....	3.00	3.00	3.00	3.50

Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Lake copper, New York.....	5.62 1/2	5.37 1/2	5.50	8.12 1/2
Electrolytic copper, refinery.....	5.25	5.00	5.12 1/2	7.25
Tin (Straits), New York.....	22.65	21.75	21.12 1/2	25.12 1/2
Zinc, East St. Louis.....	2.80	2.75	2.60	3.82 1/2
Zinc, New York.....	3.17	3.12	2.97	4.17 1/2
Lead, St. Louis.....	2.95	2.85	2.55	4.22 1/2
Lead, New York.....	3.10	2.95	2.70	4.40
Antimony (Asiatic), N. Y.....	5.00	5.00	5.00	6.60

Finished Steel

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.60	1.60
Bars, Chicago.....	1.70	1.70	1.70	1.70
Bars, Cleveland.....	1.65	1.65	1.65	1.65
Bars, New York.....	1.95	1.95	1.95	1.93
Tank plates, Pittsburgh.....	1.60	1.60	1.60	1.60
Tank plates, Chicago.....	1.70	1.70	1.70	1.70
Tank plates, New York.....	1.898	1.898	1.898	1.88
Structural shapes, Pittsburgh.....	1.60	1.60	1.60	1.60
Structural shapes, Chicago.....	1.70	1.70	1.70	1.70
Structural shapes, New York.....	1.86775	1.86775	1.86775	1.85 1/2
Cold-finished bars, Pittsburgh.....	1.70	1.70	1.70	2.10
Hot-rolled strips, Pittsburgh.....	1.45	1.45	1.45	1.55
Cold-rolled strips, Pittsburgh.....	2.00	2.00	2.00	2.15

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

▲ ▲ ▲ The Iron Age Composite Prices ▲ ▲ ▲

Finished Steel

AUG. 9, 1932	1.976c. a Lb.
One week ago	1.976c.
One month ago	1.976c.
One year ago	2.014c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products make 85 per cent of the United States output.

	High	Low
1932.....	1.976c, June 28; 1.926c, Feb. 2	
1931.....	2.037c, Jan. 13; 1.945c, Dec. 29	
1930.....	2.273c, Jan. 7; 2.018c, Dec. 9	
1929.....	2.317c, April 2; 2.273c, Oct. 29	
1928.....	2.286c, Dec. 11; 2.217c, July 17	
1927.....	2.402c, Jan. 4; 2.212c, Nov. 1	

Pig Iron

\$13.76 a Gross Ton
13.76
13.76
15.50

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

High	Low
14.81, Jan. 5; 13.76, July 5	
15.90, Jan. 6; 14.79, Dec. 15	
18.21, Jan. 7; 15.90, Dec. 16	
18.71, May 14; 18.21, Dec. 17	
18.59, Nov. 27; 17.04, July 24	
19.71, Jan. 4; 17.54, Nov. 1	

Steel Scrap

\$6.83 a Gross Ton
6.50
6.42
9.25

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

High	Low
\$8.50, Jan. 12; \$6.42, July 5	
11.33, Jan. 6; 8.50, Dec. 29	
15.00, Feb. 18; 11.25, Dec. 9	
17.58, Jan. 29; 14.08, Dec. 3	
16.50, Dec. 31; 13.08, July 2	
15.25, Jan. 11; 13.08, Nov. 22	

Pittsburgh Trade Remains Hopeful; Sharp Rise in Steel Scrap Price

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PITTSBURGH, Aug. 9.—While improved orders for finished steel products have not yet made their appearance in this district, inquiries have become more numerous in the last week, and consumer interest has gained greatly. Sentiment continues extremely favorable, even though the most optimistic opinion seems to expect little concrete recovery before September.

Possibly the most significant development of the week has been a sharp rise in scrap prices, occasioned by a sale into consumption at \$1 a ton over the last previous mill purchase.

Generally speaking, the last week has been a quiet one for the steel industry. Tin plate releases have declined further, but recent decreases in sheet and strip steel orders seem to have been checked. Automobile tonnage continues very light, but other sources of consumption are holding their own. The same can be said of other finished steel lines. Shipments of merchant wire products are expanding slightly. Orders from the railroads show no change, but continue to be the source of much hope. Structural steel and reinforcing bar business is being sustained by highway projects, and new inquiry is appearing at a good rate.

Steel ingot production in the district is holding its own at about 15 per cent of capacity. It is now believed that the month will see no further declines, but one large plant will complete a fortnight's schedule this week, and may be expected to again become idle. Valley production averages below 15 per cent, but the week's average may not be more than a point under this figure. Wheeling district schedules are unchanged.

Finished steel prices are still untested by tonnage purchases, but are sentimentally strong on all products, except some grades of sheets and tin plate. Efforts are being made to strengthen this weakness, and seem to be meeting with some success, particularly in the case of black sheets.

Pig Iron

Expected resumption of production by certain foundries in this district will likely improve pig iron melt in the latter half of the month. Other consumers do not plan to get under way until after Labor Day. Current shipments are about the same or slightly heavier than they were in July. Prices are well maintained at

Confidence unabated, although steel business has failed to gain.

* * *

Sharp rise in heavy melting scrap price is week's most significant development.

* * *

Steel ingot output is holding its own. Further declines this month not expected.

▼ ▼ ▼

\$15, Pittsburgh, on foundry, malleable and Bessemer iron, and basic is nominal at recent levels. Valley furnaces are quoting foundry and malleable iron at \$14.50 and Bessemer at \$15.

Semi-Finished Steel

Shipments are lighter than they were in July because of the reduced requirements of non-integrated makers of sheets, tin plate and strip steel. Prices are relatively firm at \$26, Pittsburgh or Youngstown, on billets, slabs and sheet bars, and \$33 on forging billets. Inquiries for wire rods seem to be more numerous, and the price is holding at \$37.

Rails and Track Accessories

The railroads are specifying no more freely than they have been. The local rail mill will continue to operate for the greater part of this week on releases from the Pennsylvania. Reports of heavier tonnage in the offing are frequently heard, but nothing concrete has developed along these lines.

Bars, Plates and Shapes

The market is featured by frequent reports of large construction projects and other business which would develop heavy tonnages of steel products. None of this business seems to have passed the formative stage, and current orders for structural steel and reinforcing bars continue lighter than they were a few weeks ago. State highway jobs predominate in both the structural and reinforcing bar markets. Nevertheless, a dam on the Kanawha River at Marmet, W. Va., will take a large tonnage of reinforcing bars. State highway work in Pennsylvania closed recently also bulks rather heavy. Merchant bars are very quiet, and plates are moving to the fabricators in limited volume. One or two sizeable inquiries for tank steel have been out recently,

but have not been acted upon. Prices remain relatively strong, but current business offers little adequate test. The minimum extra of \$5 a ton applying to bars of special forging quality affects all material 1½ in. square or larger, rather than ½ in. square, as reported last week.

Cold-Finished Steel Bars

The volume of releases shows little change, but prices continue to gain strength. The 1.70c., Pittsburgh, price on lots of 10,000 lb. or more is well maintained, and differentials on smaller lots are generally being applied.

Tubular Goods

Pipe makers report little change in their business this month. Oil country goods are possibly moving in slightly less volume. This is attributed to restricted drilling operations in the east Texas fields. Line pipe business is lacking, and standard pipe continues very dull. Pipe mill operations in the district average from 10 to 15 per cent of capacity.

Wire Products

Inquiry for nails and other merchant wire products is becoming somewhat heavier. Releases, however, have not shown any gain over July. Manufacturers' wire seems to be somewhat less active than it was last month. Road mesh is moving fairly well and two local companies have shared in an order for 2000 tons of wire mesh to be used in Mississippi River flood control work. Prices on wire products are holding, and an advance to apply on fourth quarter business is being contemplated.

Sheets

Sheet tonnage last week was about equal to the July average, and the decline in demand occasioned by lower automobile schedules seems to be checked. The other important outlets for sheets are dormant, although stove makers are increasing their requirements slightly. Production continues light and averages scarcely 15 per cent of capacity.

The price structure is still being watched carefully, and progress in stabilization is being made on some finishes. In one important territory ruinous competition among jobbers of galvanized sheets has apparently been eliminated, and the 2.20c., Pittsburgh, price on hot-rolled annealed material

seems to be better established. Shading of steel furniture and automobile body sheets is encountered occasionally. The other finishes are holding fairly well at recent levels.

Tin Plate

Declining demand from the container manufacturers is still in evidence, and mill schedules will show further declines this week. The industry as a whole is not operating at more than 35 per cent of capacity, while several independent producers are not doing that well. The prospect of improvement this month is not very good, but further declines in production are not likely.

Strip Steel

Strip makers are adversely affected by lack of automobile tonnage, as miscellaneous consumption has failed to offset the absence of important buying from Detroit. Makers of washing machines and oil burners are taking heavier allotments and inquiry in general shows some improvement. Prices are well maintained at 1.45c. to 1.50c., Pittsburgh, on hot-rolled strip, and 2c. on cold-rolled.

Coke and Coal

The coke market has reflected no gain in the last few days. Foundry shipments are still reduced, but a number of plants which have been down are expected to resume production after Labor Day. The furnace grade is very quiet. Coal business is further depressed by the light movement of Lake cargo tonnage.

Scrap

Higher prices on the principal railroad lists, which were sold last week, have served to bolster the market on No. 1 heavy melting steel. Although the Baltimore & Ohio list is reported to have brought only \$8.25, the heavy melting steel on the Pennsylvania list was taken by dealers at \$8.75, and apparently was sold to a large consumer at \$9 or better. This represents an increase of \$1 a ton over sale into consumption in the preceding week. Dealers are bidding as high as \$8.25 to cover this \$8 order, and scrap is increasingly difficult to buy at recent low levels. Secondary dealers are reluctant to sell in view of the strength of the market, and brokers are looking for further price advances. The other grades are unchanged in the absence of transactions, but a strong tone is apparent throughout the list. Hydraulic compressed sheets are still quoted at a low level, even though this material is scarce. A sale two weeks ago at \$7.25 was erroneously reported as \$7.75.

The tenth national exposition of power and mechanical engineering has been scheduled to be held at the Grand Central Palace, New York, Dec. 5 to 10, coincident with the annual meeting of the American Society of Mechanical Engineers.

Valley Mills Report Steel Orders at Lowest Point of the Year

YOUNGSTOWN, Aug. 9.—Customers of Valley steel mills are generally reported to be showing more interest in fall requirements, even though definite inquiry is slow in making its appearance. Current releases are probably at the lowest rate of the year and mill schedules are equally unsatisfactory. Favorable sentiment is maintained by the knowledge that August is always a quiet month in which little new business can be expected.

Demand for pipe and wire products is holding up fairly well, even though aggregate tonnage is light. The improved position of the petroleum industry is also indicated by inquiry for tank steel, even though oil country goods make up the bulk of the industry's present releases. Butt-weld pipe is extremely dull and electric weld units in the district are getting only enough tonnage to operate two or three turns a week on the average. Specifications for wire products continue to show the slight acceleration which was evident during July.

Flat rolled products have been affected most adversely in the last two weeks. Sheets and strip are moving to the automobile industry in generally reduced volume and the losses are felt rather keenly in this district. Demand for sheets from nearby manufacturing consumers is holding up somewhat better and some of the large

stamping and fabricating firms in the district are increasing their orders. Tin plate specifications continue to decline, but the possibility remains for an increase in late August or early September to accommodate late crops. Tin mills in this district are running at about 35 per cent of capacity.

The steel price structure is a matter of much favorable comment. Efforts to correct the weak schedules on some finishes of sheets are somewhat more successful than they were. Strip is rather well maintained at 1.45c. to 1.50c., Pittsburgh, on hot-rolled and 2c., Pittsburgh, on cold-rolled. Bars and plates are firm at 1.60c., Pittsburgh, and wire products are stronger than they have been in many months. The prospects of improved business next month is made doubly important by the opportunity which will be offered to test steel prices thoroughly.

Steel ingot production in the Valleys and northern Ohio outside of Cleveland averages no higher than 15 per cent and occasionally falls lower because of intermittent operations at some plants. Three of the large steel making plants in the district were entirely idle last week. The blast furnace at Warren, Ohio, was scheduled to resume production this week.

The scrap market is quiet, but prices are fairly strong.

St. Louis Pig Iron Trade Reflects Better Feeling

ST. LOUIS, Aug. 9.—While definite inquiries and orders are lacking, pig iron makers say their contacts with melters show that a decidedly better feeling exists. Melters are awaiting orders for finished products before making commitments for pig iron. Prices continue firm and unchanged. Shipments of the St. Louis Gas & Coke Corp'n. in July gained over those of June.

Steel

Demand for plates, shapes and bars is light, but the price structure remains firm. The general contract for the Oklahoma highway bridge at Bridgeport, requiring 3000 tons of structural steel, has been awarded to the Kansas City Bridge Co., and it is understood here the steel will be fabricated by the American Bridge Co.

Scrap

Dealers regard the prospects for the scrap trade as being brighter than at any time this year, despite the lack of actual business, and declare that they would not sell any considerable tonnages at present prices. They be-

lieve that the mills will come into the market after Labor Day. Stocks in hands of mills are said to be comparatively small if there is any marked pick-up in business. An interest here bought 3000 tons of car wheels. Railroad lists: New York, Chicago & St. Louis, 36 carloads; Kansas City Southern, 170 tons; Great Northern, 1300 tons; Chicago, Burlington & Quincy, 4600 tons of 85, 90 and 100-lb. relaying rails. Prices are nominally unchanged.

Canadian Industry is Slowing Down

TORONTO, Aug. 8.—Business in the iron and steel industry is without feature. Sales are being made, but in small quantity lots and mostly for spot delivery. No future booking has been reported and no inquiry is out which might indicate buying in a large way. Most producers state that backlogs have been cleaned up. Plant operations are slowing down to some extent. The automotive industry is slowing down, General Motors having announced that the Oshawa works will be closed for about six weeks, after which the plant will resume on new models.

Chicago Trade Expects Revival of Railroad Buying to Lead Upturn

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CHICAGO, Aug. 9.—Demand for iron and steel has shown little change and steel works operations have actually receded still further but feeling in the trade has improved markedly. It is realized that rising prices of securities and farm products are lifting the burden of debt, and that in time reduced indebtedness will make itself felt in freer buying of commodities in general. Already a slight betterment has been noted in demand for wire products, but the outlook in the farm implement trade is still obscure. Some implement makers have considerable stocks of farm machinery on hand and most of them are carrying considerable instalment paper, on which a large percentage of the payments are in arrears. Some increase in output will occur in a month or two when the customary fall production schedules are started, but the extent of the gain will depend entirely upon the improvement in farmer buying power in the interim.

Among the major groups of iron and steel consumers, the railroads are expected to increase their commitments first. Car repairs have been neglected and a serious shortage of certain types of equipment could develop with a relatively small increase in traffic in the case of grain cars. While the first move of the carriers will likely be to undertake extensive repairs of cars in their own shops, recent purchases of scrap and other material by railroad equipment makers suggest that orders for car accessories, and possibly new cars, may not be far off. A survey of the equipment of representative Western roads disclosed that 33 per cent of all freight cars are more than 20 years old, while from 50 to as high as 80 per cent have been in service more than 10 years. On a number of lines from one-quarter to one-third of existing cars are considered in too poor condition to warrant expenditures for repairs.

Steel ingot output in this district is well below 10 per cent of capacity, an independent plant having taken off an open-hearth since a week ago. However, the South Works plant of the Illinois Steel Co., which was shut down last week, is scheduled to resume on Wednesday and this will raise the average to 12 or 13 per cent. At the same time two banked blast furnaces at South Works will be put back into service, which will increase

Demand for iron and steel is unchanged, and ingot output is below 10 per cent.

* * *

Scrap market buoyant, with rises of 50c. to \$1 a ton on many grades.

* * *

Railroad rehabilitation of equipment expected to develop soon.

♦ ♦ ♦

the number of active steel works stacks to eight of a total of 36 in the district.

Pig Iron

Pig iron shipments have not improved, but betterment is in sight. Here and there melters are accepting more iron, not so much because they are getting more castings business as because they view the future with greater confidence.

Bars

A recession in demand from the automotive trade has not yet been offset by an increase in specifications from other sources. Farm equipment makers, although encouraged by advances in the prices of agricultural products, are either idle or operating at a very low rate and are taking little steel.

Structural Material

Awards and inquiries are light. Most current projects are of a public or semi-public character. Four new buildings for the Chicago World's Fair, which are about to be placed, call for 2000 tons in the aggregate. A proposed 2000-ft. tower for the fair, calling for 15,000 tons, may or may not be constructed, depending upon whether the financing can be arranged.

Cast Iron Pipe

Sellers are more successful in obtaining \$30 to \$32 a ton, Birmingham, on small lots of 6-in. and larger diameter pipe. In general the market remains slow. Sheboygan, Wis., still contemplates coming into the market. St. Louis opened bids this week on a tonnage of 30-in. pipe.

Reinforcing Bars

Bids are still being taken on road work, and mills are booking new ton-

nages for this purpose. Road contractors are rather slow in ordering shipments. The moderate pick-up in private work, noted a week ago, is more than holding, though prospects for large tonnages from this source are not bright.

Plates

Specifications show no improvement, and new business is negligible. Pending tank work is slow in moving toward the contracting stage and no new inquiries are reported.

Rails and Track Supplies

Aside from a prospective inquiry from the Northern Pacific for 15,000 tons of rails, there is virtually no track material business in sight. Rail specifications have been exceedingly light and, unless the policy of the railroads undergoes a marked change, rail rollings for the country this year may not exceed 300,000 tons.

Sheets

Mill operations are irregular and probably do not average more than 15 per cent of capacity. Specifications show no signs of betterment.

Wire Products

Bookings thus far in August have been running 2 to 5 per cent ahead of those of July, depending on the product. This gain is encouraging because August is usually the poorest month of the year in the wire trade. Improved sentiment in the agricultural areas is gradually being translated into orders for material.

Strip Steel

With the recession in automobile production and the failure of business to pick up in other directions, demand for strip has fallen to the lowest level of the depression.

Scrap

The local market shows accumulating strength. A mill which has a lower freight rate than other steel works, and likewise is somewhat less exacting in its specifications, has purchased 5000 tons of heavy melting steel at \$5.50. Brokers that participated in the order are finding it difficult to cover and in some cases have offered as high as \$5.75. The American dealer who recently sold 25,000 tons to a Canadian mill is now offering \$6 at local docks for heavy melting steel without finding any takers.

Eastern Pennsylvania Trade Awaits Tangible Improvement

No Abatement of Confidence, Though Actual Business Has Failed to Show Any Gains

PHILADELPHIA, Aug. 9.—The iron and steel trade in this district reflects the general improvement in sentiment throughout the country. At the same time the feeling is characterized by restraint, awaiting further indications of tangible betterment. So far as new business is concerned, the industry reports no headway. Some mills state that their customers are receiving a greater volume of orders and more inquiries. Other mills have made surveys among customers who report no change in actual business conditions, but a better "tone." For the most part, the industry does not look for any marked increase in business until the middle or latter part of next month. By that time, it is generally felt, operations will be stepped up several points. No prophecy is being made as to when output will reach a really satisfactory basis.

Railroad buying still lags, but would undoubtedly show a quick pick-up if traffic should rise to good volume. The oil industry is showing more interest in the market, and in some quarters it is believed it will be one of the first lines to come into the market for important tonnages.

Steel ingot output remains at 14 per cent of capacity.

Pig Iron

Inquiry is dull and business taken is confined to carlots. Prices are unchanged, but continue to be influenced by importations. Pig iron imports at Philadelphia last week totaled 4917 tons, of which 4711 tons came from Sweden and 206 tons from India.

Plates, Shapes and Bars

The market for heavy rolled products shows no improvement generally. Some plate makers report somewhat greater bookings of miscellaneous lots, but sizeable business is lacking. Hope is expressed that the oil industry soon will come into the market. Railroad buying is not looked for until traffic attains a better volume, which would give a return on investment for repairs and new equipment. Large scale buying of new equipment does not seem to be an early prospect, though it is understood some carriers are planning to purchase new locomotives. The Pennsylvania Railroad has released about 4000 tons of structural steel for work at Newark, N. J. It includes a new viaduct, foundation for a passenger station and a few steel poles. The fabricating tonnage went to the McClintic-Marshall Corp., the Shoe-

maker Bridge Co. and the Fort Pitt Bridge Works. The McClintic-Marshall Corp. was awarded 1360 tons for an office building for the Bell Telephone Co. in Philadelphia.

Sheets

Stove makers are taking fair-sized tonnage of sheets. Other buying is extremely light. Prices are unchanged.

Scrap

The scrap market has developed a firmer tone. It is most marked in heavy melting steel, while the cast grades show somewhat greater strength. The improvement is chiefly of a sentimental nature. Mills are not buying on a large scale, but are showing more interest in the market in the expectation that business soon will start on the upgrade and that they will need greater supplies for stocks which in several instances are almost depleted. Several large lots of No. 2 heavy melting steel were bought last week in this district at \$5, delivered, while lighter tonnages of No. 1 heavy melting steel also were sold at \$6.50, delivered. Quotations of both grades are unchanged, No. 1 at \$6 to \$6.50 and No. 2 at \$4.50 to \$5.

Continental Steel Prices Easier; Foreign Markets Dull

Chinese Government Buys Railway Material in England—Russia Orders German Rolling Mill Equipment

LONDON, ENGLAND, Aug. 8 (*By Cable*).—The iron and steel markets are still under holiday influences and the outlook is very uncertain as forward buying is at low ebb. The Continental depression is unrelieved. Gold prices for Continental steel products are easier.

Welsh tin plate prices are firm because of restricted output and higher tin prices. There is a moderate inquiry, but business is quiet.

The Chinese Government has placed orders for £100,000 worth of railway

material in Great Britain, including 10,000 tons of rails.

The German Siegenger Maschinenbau has concluded a provisional contract for rolling mill equipment valued at 3,000,000 marks for Russia.

Russian output of pig iron in the first half of the year was 3,000,000 tons, while the raw steel output during the same period was 2,900,000 tons.

At the annual meeting of Ougree-Marihaye of Belgium it was stated that the company's steel output had increased 12.9 per cent this year over the corresponding period last year. However, steel prices were 50 per cent below the pre-war level and wages on the gold basis were 50 per cent above the pre-war level.

Polish steelmasters have agreed on a prolongation of the steel syndicate until the end of 1935. The Polish Friedenshutte intends to dismiss 600 men, making a total of 2000 workers that will have been discharged.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	£9 0s.		
Billet, open-hearth...	4 17	6d to £5	7s. 6d
Black sheets, Japanese specifications	9 12	6	
Tin plate, per base box	15 3	to 15 6	
Steel bars, open-hearth	7 17½	to 8 7½	
Beams, open-hearth...	7 7½	to 7 17½	
Channels, open-hearth...	7 12½	to 8 2½	
Angles, open-hearth...	7 7½	to 7 17½	
Black sheets, No. 24			
gauge	8 0	to 8 10	
Galvanized sheets, No. 24			
gauge	9 0	to 9 2 6	

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at \$4.86	
Billets, Thomas...	£1 18s.
Wire rods, No. 5 R.W.G.	4 10
Black sheets, No. 31	
gauge, Japanese...	11 5
Steel bars, merchant...	2 2
Beams, Thomas...	2 2
Angles, Thomas, 4-in. and larger...	2 2
Angles, small...	2 4
Hoops and strip steel over 6 in. base...	3 0
Wire, plain, No. 8...	5 7½
Wire, barbed, 4-pt. No. 11 R.W.G.	8 15

Higher Scrap Prices Expected at Detroit

DETROIT, Aug. 9.—Local scrap prices are showing a tendency to firm up. Dealers expect to see higher prices within another week or two. To date, however, there has been no change in the quotations which have been in effect for the past few weeks. Very little scrap has been coming out. One firm reports more mill inquiries than for some time in the recent past.

New York District Iron and Steel Demand Is Unchanged

In Neither Pig Iron Nor Finished Products Is There Any Appreciable Betterment in Orders

NEW YORK, Aug. 9.—Although not very much business is expected to develop in August, the steel trade has been somewhat disappointed that the obvious revival of confidence has had no reflection in the steel market even in a small way. The aggregate volume of orders thus far in August is not running ahead of the July average.

Except for some irregularities in sheets, prices seem to be holding very well. Galvanized sheets have been available at 2.70c. to 2.75c. a lb., Pittsburgh, but these prices are largely traceable to the liquidation of a stock by a mill which is now idle.

An inquiry for 4000 tons of fabricated structural material for New Jersey highway bridges is the outstanding project in the construction field. The fabricating industry is naturally much interested in the efforts being made to finance the construction of the Thirty-eighth Street tunnel and the Triborough bridge by loans from the Reconstruction Corporation, but even if money soon becomes available for these projects the steel contracts may not be let for some months.

Pig Iron

Though sentiment has been bolstered further by the recent uptrend in security values, the trade is generally skeptical that the attendant renewal of confidence will impart early benefits to the pig iron business. While scattered gains in foundry melt are reported, operations reflect no change from the low average that has long prevailed. New inquiry is devoid of important tonnage, although interest in forward commitments is somewhat better. A slight contraction of buying is indicated in total bookings last week of only 1000 tons, compared with 1500 tons in each of the two preceding weeks. With current transactions limited to small lots, prices are untested.

Reinforcing Bars

The New Jersey State Highway Commission has issued specifications covering four bridges in Bergen County, which will require a total of about 600 tons. The only sizable award in the past week was to Concrete Steel Co. for 300 tons of bars for the Federal court house in New York. Prices are well maintained at 1.75c., Pittsburgh, and 2.10c., New York.

Scrap

Demand for all grades is quiet. The rising security and commodity markets have lent a stronger tone to scrap prices, but the paucity of orders affords no evidence upon which to determine any price changes. Mill releases are notably slow in appearing.

New England Pig Iron Sales are Small

BOSTON, Aug. 9.—Pig iron sales in this market fell off last week, approximating 700 tons, and including 500 tons to a Massachusetts machinery manufacturer and a few carlots. The 500-ton lot was part of an original 700-ton inquiry, and was split three ways, 350 tons going to an eastern Pennsylvania furnace. A Connecticut melter is in the market for 300 to 500 tons of No. 1X and No. 2X, fourth quarter iron, and numerous small foundries are making tentative inquiry.

The scrap situation has not changed perceptibly. Buying by brokers is on a very limited scale and New England melters are either out of the market or purchasing in truck lots from nearby local yards. Sentiment in the trade is cheerful, however, as more extensive buying is anticipated within the near future. New England scrap stocks are comparatively small.

Birmingham Iron and Steel Demand Unchanged

BIRMINGHAM, Aug. 9.—August is bringing no relief to the pig iron market. Three blast furnaces are active, but one is scheduled to be blown out within the next 10 days. This is No. 1 furnace of Republic Steel, which was to have been stopped this week. Of the other two active stacks, one is on foundry and one on basic. Both Sloss-Sheffield Steel & Iron and Republic Steel are now shipping from stocks. Sales are light and not much better than those of July. Within the past week inquiries have been slightly more numerous. The latter part of the month is expected to bring an increase in tonnage from pressure pipe and stove manufacturers. Pig iron quotations for Southern delivery remain at \$11.

Both plants of the American Cast

Iron Pipe Co., which were closed on Aug. 1, resumed work on Aug. 8. Other plant schedules are varied and limited.

Steel

As a result of the allocation of Federal funds for road building, a considerable amount of road and bridge work is being planned in the South for the next several months. This new work will require a fair tonnage of reinforcing and structural steel. Current orders for finished steel are still for small tonnages, with the aggregate volume unchanged. There has been some fluctuation in sheet quotations, but these have been stabilized. Six open-hearths are in operation, no change having taken place in the past five weeks.

Scrap

A better feeling is evident, but this has not been translated into business activity. Prices are nominal, owing to the stagnant market.

Buffalo Pig Iron Sales Gain Moderately

BUFFALO, Aug. 9.—The volume of quiet selling in pig iron is increasing. One maker reports the sale of 1000 tons in lots from single carloads up to 200 tons during the week. There have been more of these 200-ton inquiries and sales during the past week or two than have been seen in any similar period for a long time. A Connecticut melter is seeking 400 tons.

Steel

The Lackawanna plant of Bethlehem Steel is operating three open-hearth furnaces this week. After a week's idleness, the Republic Steel Corp. started up three open-hearths Sunday night for the current week. The Wickwire Spencer Steel Corp. is operating one open-hearth. The Seneca Iron & Steel Co. is operating at about 25 per cent. A Buffalo fabricator has taken contracts for a 100-ton bridge for the State of New York at Potsdam, another State bridge of 300 tons at Cortland, N. Y., and a 400-ton bridge at Newton, Mass. Another structural fabricator has taken a contract for 122 tons for a State bridge in Monroe County.

Scrap

The market is slowly but surely tightening. One important dealer is informing all inquirers for any grade of material that he is not now ready to sell. It is doubtful if a sizeable tonnage of any commodity could be purchased at today's prices. A development of the week was the purchase by a large radiation interest of a considerable tonnage of stove plate. The price is understood to have been \$6.50. Other stove plate sales are noted at the same price. There is a growing demand for No. 1 machinery cast.

Cleveland Steel Trade Affected by Slowing Down in Motor Cars

Almost Total Absence of Automobile Orders Brings Open-Hearth Shutdown and Ingot Rate of 12 Per Cent

CLEVELAND, Aug. 9.—The volume of business in the heavier rolled steel products this month has shown virtually no change as compared with July. However, there has been a tapering off in orders for sheets and strip steel, which is largely due to the slowing down of the motor car industry. The only improvement in an unusually dull market situation the past week was in pig iron, for which there was more inquiry than for some time.

An almost total absence of demand for steel from the automotive industry is reflected in a five-point reduction in ingot production in Cleveland this week to 12 per cent of capacity, the decline resulting in shutting down of the steel plant of the Otis Steel Co., which has been operating two open-hearth furnaces. With the American Steel & Wire Co. open-hearth furnaces still idle, the only local steel plant operating is that of the Corrigan, McKinney Steel Co., which has four furnaces running.

No revival in demand for steel from the motor car industry is looked for until September, when some of the makers are expected to get under production on new models. The improvement in sentiment so far has not been backed up by any gain in activity by metal-working plants in this territory although a few of these plants report a little increase in inquiry for their products. Prices are being well maintained on the limited amount of business that is being placed, there being little pressure for concessions.

Pig Iron

Some consumers are showing an interest in covering for their requirements for the next two months or for the remainder of the year, and this has resulted in an improvement in inquiry. Three foundries in Ohio, Indiana and Michigan are in the market for lots from 500 to 800 tons of foundry iron. Very little business was taken during the week, and shipments are very light. Automobile foundries are operating at low schedules this month and are taking little iron. Prices appear to be well maintained at \$14.50, Cleveland, for foundry and malleable iron for outside shipment and \$15.50 for local delivery.

Iron Ore

While the movement continues very

slow, ore firms look for a slight gain in shipping orders in September. Receipts of Lake Superior ore at Lake Erie ports in July were 470,420 tons and for the season 625,938 tons, against 6,138,437 tons during the corresponding period last year. Shipments during July were 428,457 tons and for the season to Aug. 1 were 963,455 tons as against 5,324,808 tons during the same period last year. Receipts at other than Lake Erie ports to Aug. 1 were 288,548 tons, compared with 3,924,450 tons for the same period last year. Dock balance at Lake Erie ports Aug. 1 was 5,298,383 tons, against 5,365,693 tons on Aug. 1 last year.

Bars, Plates and Shapes

Little new inquiry for fabricated steel came out during the week. Several highway jobs are pending in Ohio and New York, but outside of public work structural activity is limited to very small lots. Demand for steel bars remains light. Business with forgers is slack, although a local forge shop is making forgings for 20,000 new model Hudson cars. Reinforcing bars are slow, orders of these seldom reaching 100-ton lots. Plate orders are confined to small lots from miscellaneous consumers. Prices are firm at 1.65c., Cleveland, for steel bars and 1.60c., Pittsburgh, for plates and shapes.

Sheets

With little business from the motor car industry, the demand has declined below the July level. Operations of the local Fisher plant, making Chevrolet bodies, declined the past week to a two-day schedule. Some new inquiry has developed from stove manufacturers who usually have a seasonal gain in production in the early fall. Demand from the refrigerator industry has become very low, and there is little activity on the part of metal furniture and barrel manufacturers. Generally prices are well maintained, although concessions are reported on galvanized sheets for barge shipment to Ohio River points.

Strip Steel

There was a slight gain in carlot inquiry for hot-rolled strip the past week from stamping plants that are figuring on new orders. With little business from the motor car plants and accessory manufacturers, specifications have further declined. The price is well maintained at 1.45c.,

Pittsburgh, which is being quoted for small lots provided the purchasers are potential buyers of carlots. For smaller consumers 1.50c. prevails. Cold-rolled strip is generally maintained at 2c., Cleveland.

Scrap

Sentiment in the trade has improved and, while the market is untested, there is a possibility that some grades could not be purchased at as low prices as have prevailed recently. However, no new demand is expected before September. A Warren mill has shut off on shipments, and the shutting down of the Otis Steel plant this week evidently will delay the time at which that company will resume taking scrap.

Pacific Coast Inquiries for Steel Increasing

SAN FRANCISCO, Aug. 8.—Sentiment continues to improve in the Far Western market. Prices are being well maintained, though volume for the past week has been small. An increased amount of figuring is being done, inquiries having increased.

Reports for June indicate that receipts of foreign material were only slightly over half of those of the previous month. Of steel products, excluding pipe and wire, 2216 tons was received in June compared with 3887 tons in May, while reinforcing bar imports dropped to 263 tons from 2000 tons in May. Of the receipts, almost half, or 1000 tons, were merchant steel bars.

It is estimated that 16,500 tons of reinforcing bars are now definitely pending on projects that are either being figured, budgeted, or on which general contracts have been awarded. Most of this volume is involved in public projects.

Cincinnati Pig Iron Orders Gain Slightly

CINCINNATI, Aug. 9.—Moderate increase in pig iron shipping orders against old contracts the past week contributed some substance to current optimistic sentiment. New bookings were light at about 500 tons. Foundries are operating at the low rate that has prevailed for several months.

Scrap

Better sentiment in other districts is reflected here in a firmer undertone. Offers for No. 1 steel are closer to market prices, but not sufficiently high to be attractive.

Fabricated Structural Steel

Awards Decline—New Projects in Larger Volume

LETTINGS in the past week dropped to 12,100 tons from 16,300 tons the week before. Bookings were chiefly for small tonnages, the largest involving 2150 tons for a bridge at Canadian, Tex., and 1360 tons for an office building at Philadelphia. Fresh inquiry, totaling 25,900 tons, compares with 9300 tons in the preceding week. Projected work is featured by a 2000-ft. tower for the Chicago World's Fair, which will require 15,000 tons, while bridges in New Jersey call for 4000 tons. Awards follow:

NORTH ATLANTIC STATES

Boston, 250 tons, warehouse for Jordan-Marsh Drug Co., to New England Structural Steel Co.
Newton, Mass., 400 tons, Parker Street and Center Street bridges, to Lackawanna Steel Construction Corpn.
Potsdam, N. Y., 100 tons, highway bridge, to Lackawanna Steel Construction Corpn.
Cortland, N. Y., 300 tons, highway bridge, to Lackawanna Steel Construction Corpn.
Monroe County, N. Y., 122 tons, highway bridge, to McClintic-Marshall Corpn.
State of Pennsylvania, 220 tons, highway bridge at Noxen, Wyoming County, to American Bridge Co.
Philadelphia, 1360 tons, office building, Bell Telephone Co., Ninth and Race Streets, to McClintic-Marshall Corpn.
Safe Harbor, Pa., 1000 tons, transmission towers for Safe Harbor Power Corpn., to Blaw-Knox Co.
Linsfield, Pa., 300 tons, highway bridge, to McClintic-Marshall Corpn.
Seward, Pa., 500 tons, highway bridge, to McClintic-Marshall Corpn.
Pittsburgh, 100 tons, factory building for A. J. Brown, to Guibert Steel Co.
Fairview, Md., 270 tons, highway bridge, to McClintic-Marshall Corpn.

SOUTH AND SOUTHWEST

New Orleans, La., 110 tons wharf framing for Charbonnet Street, wharf, to Southern Steel Works.
Beaver County, Okla., 200 tons, highway bridges, to J. B. Klein Iron & Foundry Co.
Coke County, Tex., 225 tons, highway bridge, to Mosher Steel & Machinery Co.
Childress County, Tex., 530 tons, highway bridge, to Mosher Steel & Machinery Co.
Lipscomb County, Tex., 160 tons, highway bridge, to Houston Structural Steel Co.
Harrison-Panola County, Tex., 380 tons, highway bridge, to Petroleum Iron Works.
Caddo-Canadian County, Tex., 2150 tons, highway bridge, to American Bridge Co.

CENTRAL STATES

Chicago, 200 tons, cattle runway for Swift & Co., to Gage Structural Steel Co.
Waukegan, Ill., 200 tons, post office, to Duffin Iron Co.
Ford County, Ill., 115 tons, I-beam highway bridge, to Mississippi Valley Structural Steel Co.
La Salle, Ill., 650 tons, bridge for Illinois Central Railroad, to McClintic-Marshall Corpn.
Indiana, 100 tons, highway bridges, to Vincennes Bridge Co.
Indiana, 350 tons, highway bridges, to Pan-American Bridge Co.
Cloquet, Minn., 200 tons, factory building, to American Bridge Co.
Jackson, Mo., 135 tons, highway bridges, to Kansas City Structural Steel Co.

WESTERN STATES

Seattle, Wash., 670 tons, highway bridge, to Isaacson Iron Works.
Silvana, Wash., 200 tons, highway bridge, S. Fork Skykomish River, to Pacific Car & Foundry Co.
Roseburg, Ore., 270 tons, Umpqua River bridge at Federal Veteran's Home, to Pittsburgh-Des Moines Steel Co.

San Francisco, 125 tons, elevator shaft alterations for Mills Bldg., to Fair Mfg. Co.
State of Wyoming, 200 tons, structures and bridges for various highway projects, to various bidders.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Boston, 350 tons, ventilation building for East Boston tunnel.
Lee, Mass., 100 tons, two highway bridges.
State of New Jersey, 4000 tons, bridges across West Shore Railroad, New York, Susquehanna & Western and Hackensack River at Little Ferry and Ridgefield Park; bids to be taken Aug. 29.
Erie Railroad, 435 tons, bridge at Erwins, N. Y.; Jones & Laughlin Steel Corpn., low bidder.
Plattsburg, N. Y., 250 tons, factory building for Berst-Foster-Dixfield Co.
State of New York, 750 tons, several highway bridges.

Reinforcing Steel

Awards 955 Tons—New Projects 3015 Tons

AWARDS

Pittsfield, Mass., 125 tons, road work, to Northern Steel Co.
New York, 300 tons, foundations for Federal court house, to Concrete Steel Co.; George J. Atwell Foundation Co., New York, general contractor.
Hagerstown, Md., 100 tons, sewage disposal plant, to Kalman Steel Co.
Sioux City, Iowa, 180 tons, post office, to Missouri Rolling Mill Co.
State of Illinois, 250 tons, road work, to Calumet Steel Co.
Chicago, 165 tons, Marine Hospital, to Calumet Steel Co.; previously reported to an unnamed bidder.
Dedham, Mass., 400 tons road work.
State of New Jersey, 445 tons, bridge over Hackensack River between Little Ferry and Ridgefield Park; bids Aug. 29.
State of New Jersey, 140 tons, three bridges and underpass in Bergen County; bids Aug. 29.
Ellwood City, Pa., 260 tons, highway bridge.
Cook County, Ill., 300 tons, road work; bids taken Aug. 4.
Chicago, 720 tons, United States Appraisers' store; Lundoff-Bicknell Co., general contractor.
Reno, 100 tons, post office, Landis & Young low bidders on general contract.
San Francisco, 300 tons, University of California hospital, King Parker Co., low bidder on general contract.
El Centro, Cal., 100 tons, hospital.

Rochelle Park, N. J., 250 tons, highway bridge.
Leetsdale, Pa., 250 tons, Watson Home for Crippled Children.
Grantsville, Md., 200 tons, highway bridge.

CENTRAL STATES

Chicago, 15,000 tons, proposed 2000-ft. tower for World's Fair.
Chicago, 1170 tons, United States Appraiser's store building; Lundoff-Bicknell Co., Chicago, low bidder on general contract.
Chicago, 700 tons, States building for World's Fair.
Chicago, 300 tons, Federal building for World's Fair.
Chicago, 500 tons, Social Service Building for World's Fair.
Chicago, 500 tons, Sears, Roebuck building for World's Fair.
Sioux City, Iowa, 778 tons, post office; Pike & Cook, Minneapolis, general contractors.
Sheboygan, Wis., 250 tons, post office.

WESTERN STATES

Los Angeles, 100 tons, airway beacon towers for El Paso route.
San Quentin, Cal., 350 tons, jail equipment for state prison, bids close Aug. 16.
Oakland, Cal., 760 tons, derricks for Navy, to Moore Dry Dock Co. (Fabricating for R. W. Kaltenbach to whom contract reported let March 3).

FABRICATED PLATE

AWARDS

Ellensburg, Wash., 325 tons, corrugated sheets for Wippel power plant, to Beall Pipe & Tank Co.

NEW PROJECTS

Memphis, Tenn., 400 tons, floating drydock for United States Engineer; bids Aug. 17.

Bakersfield, Cal., 150 tons, county hospital addition.

Weimar, Cal., 100 tons, reservoir at State sanitarium.

Pipe Lines

Superior Water, Light & Power Co., Superior, Wis., is considering extensions in pipe lines for gas service to Allouez and Itasca, Wis. Estimated cost \$50,000.

National Dredging Co., 233 Broadway, New York, has made application for Federal permission for installation of 27-in. discharge pipe line, about 2500 ft. long in Delaware River, vicinity of Mantua Creek, N. J., for use in connection with dredging operations.

Minnesota Northern Gas Co., Minneapolis, Minn., plans early installation of 8-in. natural gas pipe line at Owatonna, Minn., and vicinity. Cost about \$55,000.

Natural Gas Pipe Line Co. of America, Inc., 20 North Wacker Drive, Chicago, has applied for permission to construct natural gas pipe line in vicinity of Muscatine, Iowa.

Reading Iron Co., Reading, Pa., has secured contract for about nine miles of 2½-in. wrought iron pipe for electrical conduit service on New Jersey meadows from Jersey City to Newark.

San Luis Obispo, Cal., opened bids for a complete water system in the Cambria district and George C. De Golyer was low bidder.

Los Angeles has called for bids on Aug. 10 for about 139 tons of 6-, 8- and 12-in. steel water pipe.

Railroad Equipment

Department of Public Works, Chicago, is asking bids on 100 tunnel cars.

Youngstown has authorized purchase of nine street cars.

Columbia Steel Co. was only bidder, at \$62,035 per ton, on 100 tons of Lorain section No. 545 rail to San Francisco for municipal street railway.

Non-Ferrous Metal Markets Gather Strength, Though Buying Still Lags

NEW YORK, Aug. 9.—Steady improvement in copper prices, particularly in foreign markets, has engendered a somewhat broader consumer interest. Substantial sales accompanied the rise in the foreign price, which advanced from 4.80c. last week to the current level of 5.45c. Absorption of low-priced Japanese offerings and withdrawal of selling pressure from other foreign quarters accounted largely for the firming in European markets. The domestic price of electrolytic metal has been established by a majority of primary producers and custom smelters at 5.50c., delivered Connecticut, while one large producer is still posting a quotation of 5.37½c. While domestic consumers are backing their partially restored confidence with more frequent purchases of copper, their optimism is tempered somewhat by their unwillingness to commit themselves for important tonnage. Large buyers are notably lagging in entering the market, and, as a result, current domestic bookings have thus far failed to provide a backlog

of significant proportions. Lake copper, which has not been an active participant in this market, has absorbed strength from the improved outlook and is quotably higher at 5.62½c., delivered.

Tin

Sharp advances in the London tin price in the past week failed to occasion a proportionate increase in the New York market, principally because of fluctuations in sterling exchange. The New York price today is 22.65c., an advance of almost 1c. over the quotation a week ago. Today's London market was £140 a ton for spot standard, £141 10s. for future standard and £144 10s. for spot Straits. The Singapore market today was £146 5s., an advance of about £9 for the week. Although a fair amount of buying was done throughout the week, consumer interest may generally be characterized as apathetic. A 125-ton shipment of tin from Liverpool last week accounted largely for a decrease of 107 tons in United Kingdom warehouse stocks, which now total 33,872 tons.

Straits shipments up to and including Aug. 6 of 843 tons indicate obviously that the estimate of 1000 tons for the month will fall far short of the actual movement during August.

Lead

Consumer buying to cover short positions followed two price advances last week to the prevailing levels of 3.10c., New York, and 2.95c., St. Louis. Although demand has subsided somewhat, a steady flow of small-lot orders for August, and in some cases for September, delivery indicates that buyers are apparently satisfied that the higher prices will resist downward tendencies at least for the immediate future.

Zinc

An advance of \$3 a ton in the ore price and further expected curtailment in production of refined metal influenced a rise in the price of zinc, which is quotable today at 2.80c., East St. Louis, and 3.17c., New York. With practically all industries that consume zinc still quiet, demand for metal is passive. The comparatively satisfactory statistical position of the zinc industry, however, augurs a bright outlook for quick improvement in the event that general business gathers momentum in the fall.

The Week's Prices. Cents Per Pound for Early Delivery

	Aug. 3	Aug. 4	Aug. 5	Aug. 6	Aug. 8	Aug. 9
Lake copper, New York.....	5.37½	5.50	5.50	5.50	5.50	5.62½
Electrolytic copper, N. Y.*.....	5.00	5.12½	5.12½	5.12½	5.12½	5.25
Straits tin, spot, N. Y.*.....	21.75	22.35	22.35	22.35	22.35	22.65
Zinc, East St. Louis.....	2.72½	2.72½	2.72½	2.75	2.75	2.80
Zinc, New York.....	3.09½	3.09½	3.09½	3.12	3.12	3.17
Lead, St. Louis.....	2.85	2.90	2.95	2.95	2.95	2.95
Lead, New York.....	2.95	3.00	3.10	3.10	3.10	3.10

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.
Aluminum, 98 to 99 per cent pure, 22.90c. a lb. delivered.
Nickel, electrolytic cathode, 35c. a lb. delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.00c. a lb., New York.
Brass ingots, 85-5-5-5, 5.75c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits, pig.....	24.00c. to 25.00c.
Tin, bar.....	26.00c. to 28.00c.
Copper, Lake.....	7.50c. to 8.50c.
Copper, electrolytic.....	7.25c. to 8.25c.
Copper, casting.....	7.00c. to 8.00c.
*Copper sheets, hot-rolled.....	14.87½c.
*High brass sheets.....	12.00c.
*Seamless brass tubes.....	15.25c.
*Seamless copper tubes.....	14.37½c.
*Brass rods.....	9.75c.
Zinc, slabs.....	4.25c. to 4.75c.
Zinc sheets (No. 9), casks.....	9.25c. to 9.50c.
Lead, American pig.....	3.75c. to 4.25c.
Lead, bar.....	5.50c. to 6.50c.
Lead sheets.....	7.50c.
Antimony, Asiatic.....	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus.....	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent.....	16.00c.
Solder, ½ and ⅓*.....	15.25c. to 16.25c.
Babbitt metal, commercial grade.....	18.00c. to 28.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	26.00c.
Tin, bar.....	28.00c.

Copper, Lake.....	6.50c.
Copper, electrolytic.....	6.50c.
Copper, casting.....	6.25c.
Zinc, slab.....	4.25c. to 4.50c.
Lead, American pig.....	3.75c. to 4.00c.
Lead, bar.....	6.75c.
Antimony, Asiatic.....	9.00c.
Babbitt metal, medium grade.....	16.00c.
Babbitt metal, high grade.....	30.50c.
Solder, ½ and ⅓.....	16.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	4.00c.	4.50c.
Copper, hvy. and wire	3.75c.	4.375c.
Copper, light and bottoms.....	2.875c.	3.25c.
Brass, heavy.....	1.75c.	2.25c.
Brass, light.....	1.375c.	1.875c.
Hvy. machine composition.....	2.625c.	3.25c.
No. 1 yel. brass turnings.....	1.875c.	2.25c.
No. 1 red brass or compos. turnings.....	2.375c.	3.00c.
Lead, heavy.....	1.875c.	2.375c.
Zinc.....	1.00c.	1.25c.
Cast aluminum.....	2.50c.	4.00c.
Sheet aluminum.....	6.50c.	8.00c.

Cast Iron Pipe

Oneonta, N. Y., awarded 200 tons of 4- to 8-in. to R. D. Wood & Co.

Lathams Corner, N. Y., placed 300 tons of 6- and 8-in. with United States Pipe & Foundry Co.

Hammonton, N. J., awarded 100 tons of 8-in. to R. D. Wood & Co.

Fond du Lac, Wis., has ordered 5700 ft. of 14-in. from Glamorgan Pipe & Foundry Co.

St. Louis, Mo., opened bids Aug. 6 on 5000 ft. of 30-in.

San Clemente, Cal., asks bids until Aug. 20 for about 335 tons of 4-, 6- and 12-in.

Santa Barbara, Cal., opened bids on 50 tons of 8-in. and American Cast Iron Pipe Co. appeared low.

At a meeting of creditors of Biehl Iron Works, Inc., Reading, Pa., representatives of Pennsylvania Electric Steel Castings Co., Morris Wheeler & Co. and Lukens Steel Co. were appointed to act as a creditors' committee. Resolutions were adopted for acceptance by creditors of two-year notes for their account to draw interest at 4 per cent, and to request deferment of bank action on claims, including mortgage and notes payable, until after expiration of the note agreement.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.85c.
Del'd Detroit	1.85c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.I.F. Pacific ports	2.10c.

Billet Steel Reinforcing (as quoted by distributors)

F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.60c. to 1.75c.

Rail Steel

F.o.b. mills, east of Chicago dist	1.35c. to 1.45c.
F.o.b. Chicago Heights mills	1.80c.

Iron

Common iron, f.o.b. Chicago	1.65c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.11c.
Common iron, del'd New York	2.15c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7935c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
Del'd New York	1.8985c.
C.I.F. Pacific ports	2.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7495c.
Del'd New York	1.8675c.
C.I.F. Pacific ports (standard)	2.10c.
C.I.F. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

Base per Lb	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago mill	2.05c
F.o.b. Buffalo	2.00c

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.	Alloy Differential per 100 Lb.
S.A.E. Series	
3000 (1/4% Nickel)	\$0.25
3100 (1 1/2% Nickel)	0.55
2800 (3/4% Nickel)	1.50
3500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
6100 Chromium Steel (0.60 to 0.80 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and Squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 1/4c. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	1.70
Bars, f.o.b. Chicago.....	1.75
Bars, Cleveland.....	1.75
Bars, Buffalo.....	1.75
Bars, Detroit.....	1.90
Bars, eastern Michigan.....	1.95
Shafting, ground, f.o.b. mill.....	2.05 to 3.00

*In quantities of 10,000 lb. or more.
†According to size.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot-rolled

		Base per Lb
No. 10 f.o.b.	Pittsburgh	1.55c.
No. 10 f.o.b.	Chicago mill	1.65c.
No. 10 del'd	Philadelphia	1.86c.
No. 10 f.o.b.	Birmingham	1.70c.
No. 10, c.i.f.	Pacific Coast ports	2.17 1/2c.

Hot-rolled and Annealed

No. 10, Pittsburgh	1.70c.
No. 10, Chicago mills	1.80c.
No. 10, Birmingham	1.85c.
No. 10, Pacific Coast ports	2.32 1/2c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.20c.
No. 24, f.o.b. Chicago mills	2.30c.
No. 24, del'd Philadelphia	2.46c. to 2.51c.
No. 24, f.o.b. Birmingham	2.35c.
No. 24, c.i.f. Pacific Coast ports	2.85c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.25c.
No. 10 gage, f.o.b. Chicago mills	2.35c.
No. 10 gage, del'd Philadelphia	2.46c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.75c.
No. 20 gage, f.o.b. Chicago mills	2.85c.
No. 20 gage, del'd Philadelphia	3.08c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	2.85c. to 2.90c.
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Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh	2.65c.
No. 20, f.o.b. Pittsburgh	3.15c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago mills	2.95c.
No. 24, del'd Philadelphia	3.16c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, c.i.f. Pacific Coast ports	3.50c.

Long Terns

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh	2.80c. to 3.00c.
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Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.50c. to 2.60c.
No. 20, f.o.b. Pittsburgh	3.00c. to 3.10c.

Tin Mill Black Plate

No. 28 f.o.b. Pittsburgh	2.40c.
No. 28 Chicago mill	2.90c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	\$4.75
Standard cokes, f.o.b. Gary	4.85

Terne Plate

(F.o.b. Morgantown or Pittsburgh) (Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I.C.	14.90
40-lb. coating I.C.	16.70

Hot-rolled Hoops, Bands and Strips

	Base per Lb.
All widths up to 24 in., Pittsburgh...	1.45c. to 1.50c.
All widths up to 24 in., Chicago...	1.55c. to 1.60c.
Cooperage stock, P'gh....	1.55c. to 1.60c.
Cooperage stock, Chicago....	1.65c. to 1.70c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.00c.
F.o.b. Cleveland	2.00c.
Del'd Chicago	2.30c.
F.o.b. Worcester	2.20c.
Fender stock, No. 20 gage, Pitts-	
burgh or Cleveland	2.90c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

(After Dec. 31, extras of 10c. a 100 lb. on mixed and joint carloads, 25c. on pool carloads and 40c. on less than carloads will be applied on all merchant wire products.)

To Manufacturing Trade

Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base per K
Standard wire nails.....	\$1.95
Smooth coated nails.....	1.95
Galvanized nails.....	3.95
	Base per Lb.
Smooth annealed wire.....	2.35
Smooth galvanized wire.....	2.80
Polished staples.....	2.50
Galvanized staples.....	2.75
Barbed wire, galvanized.....	2.60

Woven wire fence No. 9 gage, per

net ton \$55.00

Woven wire fence, No. 12 1/2 gage

and lighter, per net ton \$60.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

STEEL PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel	Black Galv.	Iron	Black Galv.
Inches		Inches	
1/2	47	1/2	47
3/4	53	3/4	53
1	58	1	58
1 1/4	62	1 1/4	62
1 1/2	64	1 1/2	64

Lap Weld

2	57	2	57
3 1/2	61	3 1/2	61
7 and 8	58	7 and 8	58
9 and 10	56	9 and 10	56
11 and 12	55	11 and 12	55

Butt Weld, extra strong, plain ends

1/2	43	1/2	43
3/4	49	3/4	49
1	55	1	55
1 1/4	60	1 1/4	60
1 1/2	62	1 1/2	62
2 to 3	63	2 to 3	63

Lap Weld, extra strong, plain ends

2	55	2	55
3 1/2	59	3 1/2	59
7 and 8	58	7 and 8	58
9 and 10	56	9 and 10	56
11 and 12	55	11 and 12	55

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2 1/2% and on galvanized by 1 1/2 points with supplementary discounts of 5 and 2 1/2%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	Charcoal Iron
2 in. and 2 1/4	1 1/4 in.
3 in.	1 1/2 in.
3 1/2 in.—2 1/2 in.	2 in.—2 1/2 in.
3 in.	2 1/2 in.—2 1/2 in.
3 1/2 in.—3 1/2 in.	3 in.
4 in.	3 1/2 in. to 3 1/2
4 1/2 in. to 6 in.	4 in.
	4 1/2 in.

On lots of a carload or more, the above base discounts are subject to a preferential of two five on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler

Tubes	Cold-Drawn
1 in.	61
1 1/4 to 1 1/2 in.	53
1 1/2 in.	37
2 to 2 1/2 in.	32
2 1/2 to 2 1/2 in.	40
3 in.	52
3 1/2 to 3 1/2 in.	54
4 in.	57
4 1/2, 5 and 6	46

Hot Rolled

2 and 2 1/4 in.	38
2 1/2 and 2 1/2 in.	46
3 in.	52
3 1/2 to 3 1/2 in.	54
4 in.	57
4 1/2, 5 and 6	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages takes the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill....	32.00
Light (from rail steel, f.o.b. mill)	
	\$28.00 to 30.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16-in. and larger.....	\$2.60
Spikes, 1/2-in. and larger.....	2.60
Spikes, boat and barge.....	2.90
Tie plate, steel.....	1.85
Angle bars.....	2.75
Track bolts, to steam railroads.....	3.50
Track bolts, to jobbers, all sizes, per 100 count.....	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	75
Carriage bolts	75
Lag bolts	75
Flange bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagonal	75
C.p.c. and t. square or hex. nuts, blank or tapped	75
Washers	* 7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including 1 in. x 6 in. take 10 per cent lower list price.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Store bolts in packages, P'gh.	77 1/2, 25 and 10
Store bolts in packages, Chicago	77 1/2, 25 and 10
Store bolts in pkgs., Cleveland	77 1/2, 25 and 10
Store bolts in bulk, P'gh.	86
Store bolts in bulk, Chicago	86
Store bolts in bulk, Cleveland	86
Tire bolts	60 and 10

Discount of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

($\frac{1}{2}$ -in. and larger)	Base per Lb.
F.o.b. Pittsburgh or Cleveland	\$2.25

Small Rivets

Small Rivers	
(7/16-in. and smaller)	
	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

Discounts to Jobbers
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List
Milled cap screws, 1 in. dia. and smaller

No. 2 busheling.....	\$1.50 to \$2.00
Locomotive tires, smooth.....	7.50 to 8.50
Pipes and flues.....	1.25 to 1.75
No. 1 machinery cast.....	6.00 to 6.50
Clean automobile cast.....	6.75 to 7.25
No. 1 railroad cast.....	5.25 to 5.75
No. 1 agricultural cast.....	4.50 to 5.00
Stove plate.....	5.00 to 5.50
Grate bars.....	3.25 to 3.75
Brake shoes.....	5.75 to 6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel.....	\$6.00 to \$6.50
No. 2 heavy melting steel.....	4.50 to 5.00
No. 1 railroad wrought.....	7.00 to 7.50
Bundled sheets.....	4.00 to 4.50
Hydraulic compressed, new.....	6.00 to 6.50
Hydraulic compressed, old.....	4.00 to 4.50
Machine shop turnings.....	3.00 to 3.50
Heavy axle turnings.....	5.50 to 6.00
Cast borings (nom.).....	3.00 to 3.50
Heavy breakable cast.....	7.50 to 8.00
Stove plate (steel works).....	6.00 to 6.50
No. 1 low phosph. heavy.....	9.50 to 10.00
Couplers and knuckles.....	6.50 to 7.00
Roller steel wheels.....	6.50 to 7.00
No. 1 blast furnace (nom.).....	3.00 to 3.50
Spec. iron and steel pipe.....	5.50 to 6.00
Shafting.....	10.00 to 11.00
Steel axles.....	11.50 to 12.00
No. 1 forge fire.....	5.50 to 6.00
Cast iron car wheels.....	8.50 to 9.00
No. 1 cast.....	8.00 to 8.50
Cast borings (chem.).....	8.00 to 10.00
Steel rails for rolling.....	9.00 to 9.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel.....	\$6.25 to \$6.75
No. 2 heavy melting steel.....	5.50 to 5.75
Compressed steel.....	5.50 to 6.00
Light bundled sheet stampings.....	4.50 to 5.00
Drop forge flashings.....	2.00 to 2.50
Machine shop turnings.....	4.00 to 4.50
Short shoveling turnings.....	5.00 to 5.50
No. 1 busheling.....	5.00 to 5.50
Steel axle turnings.....	5.00 to 5.50
Low phosph. billet crops.....	9.00 to 10.00
Cast iron borings.....	3.50 to 4.00
Mixed borings and short turnings.....	3.00 to 3.50
No. 2 busheling.....	3.00 to 3.50
No. 1 cast.....	6.50 to 7.00
Railroad grate bars.....	5.00 to 5.50
Stove plate.....	5.00 to 5.50
Rails under 3 ft.....	8.50 to 9.00
Rails for rolling.....	8.50 to 9.00
Railroad malleable.....	7.25 to 7.50
Cast iron car wheels.....	7.00 to 7.50

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel.....	\$6.50 to \$7.00
No. 2 heavy melting steel.....	5.00 to 5.50
Scrap rails.....	6.75 to 7.25
New hydraulic comp. sheets.....	5.00 to 5.50
Old hydraulic comp. sheets.....	4.00 to 4.50
Drop forge flashings.....	2.00 to 2.50
No. 1 busheling.....	5.00 to 5.50
Hvy. steel axle turnings.....	6.00 to 6.50
Machine shop turnings.....	4.00 to 4.50
Knuckles and couplers.....	10.00 to 10.50
Coil and leaf springs.....	10.00 to 10.50
Roller steel wheels.....	10.00 to 10.50
Low phosph. billet crops.....	10.00 to 10.50
Short shov. steel turnings.....	5.50 to 6.00
Short mixed borings and turnings.....	3.75 to 4.25
Cast iron borings.....	3.75 to 4.25
No. 2 busheling.....	3.50 to 4.00
Steel car axles.....	10.00 to 11.00
Iron axles.....	10.00 to 11.00
No. 1 machinery cast.....	9.00 to 9.50
No. 1 cupola cast.....	8.25 to 8.75
Stove plate.....	6.50 to 7.00
Steel rails, 3 ft. and under.....	8.75 to 9.25
Cast iron car wheels.....	8.00 to 9.00
Industrial malleable.....	7.00 to 7.50
Railroad malleable.....	7.00 to 7.50
Chemical borings.....	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel.....	\$7.00 to \$7.50
Scrap steel rails.....	7.00 to 7.50
Short shoveling turnings.....	4.00 to 4.50
Stove plate.....	6.00 to 6.50
Steel axles.....	9.00 to 9.50
Iron axles.....	9.00 to 9.50
No. 1 railroad wrought.....	4.50 to 5.00
Rails for rolling.....	8.00 to 8.50
No. 1 cast.....	7.50 to 8.00
Tramcar wheels.....	8.00 to 8.50
Cast iron borings, chem.....	8.50 to 9.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel.....	\$5.50 to \$6.00
No. 1 heavy melting.....	4.25 to 4.75
No. 2 heavy melting.....	4.50 to 5.00
No. 1 locomotive cast.....	4.75 to 5.25
Misc. stand-sec. rails.....	5.50 to 6.00
Railroad springs.....	6.50 to 7.00
Bundled sheets.....	2.75 to 3.25
No. 2 railroad wrought.....	4.25 to 4.75
No. 1 busheling.....	4.00 to 4.25
Cast iron borings and shoveling turnings.....	2.75 to 3.25
Iron rails.....	7.00 to 7.50
Rails for rolling.....	6.00 to 6.50
Machine shop turnings.....	1.50 to 2.00
Heavy turnings.....	3.00 to 3.50
Steel car axles.....	8.25 to 8.75
Iron car axles.....	11.00 to 11.50
Wrot. iron bars and trans.....	5.00 to 5.50
No. 1 railroad wrought.....	3.50 to 4.00
Steel rails less than 3 ft.....	8.50 to 9.00
Steel angle bars.....	6.00 to 6.50

Cast iron car wheels.....	4.50 to 5.00
No. 1 machinery cast.....	6.50 to 7.00
Railroad malleable.....	5.00 to 5.50
Stove plate.....	5.75 to 6.25
Relay rails, 60 lb. and under.....	16.00 to 16.50
Relay rails, 60 lb. and over.....	20.00 to 21.00
Agricult. malleable.....	5.00 to 5.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel.....	\$2.85 to \$4.00
No. 2 heavy melting steel.....	1.50 to 1.75
Heavy melting steel (yard).....	1.50 to 1.75
No. 1 hvy. breakable cast.....	4.50 to 4.75
Stove plate (steel works).....	2.25 to 2.75
Machine shop turnings.....	0.50 to 1.00
Short shoveling turnings.....	0.50 to 1.00
Cast borings.....	0.50 to 1.00
No. 1 blast furnace.....	0.50 to 1.00
Steel car axles.....	5.00 to 5.50
Spec. iron and steel pipe.....	2.00 to 2.50
Forge fire.....	3.25 to 3.50
No. 1 railroad wrought.....	4.00 to 4.50
No. 1 yard wrought, long.....	3.25 to 3.50
Rails for rolling.....	5.00 to 5.50
No. 1 cast.....	5.00 to 5.25
No. 2 cast.....	4.00 to 4.50
Stove plate (foundry).....	3.25 to 3.50
Malleable cast (railroad).....	3.50 to 4.00
Cast borings (chemical).....	6.00 to 6.50
Per gross ton, delivered local foundries:	
No. 1 machinery cast.....	\$7.00 to \$7.50
No. 1 hvy. cast (cupola size).....	7.00 to 7.50
No. 2 cast.....	4.00 to 4.50

PITTSBURGH

Base per Lb.	
Plates.....	2.85c
Structural shapes.....	2.85c
Soft steel bars and small shapes.....	2.60c
Reinforcing steel bars.....	2.60c
Cold-finished and screw stock.....	2.95c
Rounds and hexagons.....	2.95c
Squares and flats.....	3.45c
Hoops and bands, under 1/2 in.....	2.95c
Hot-rolled annealed sheets (No. 24).....	3.15c
25 or more bundles.....	3.65c
Hot-rolled sheets (No. 10).....	3.10c
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.).....	\$3.74
Spikes, large.....	2.50c
Small.....	2.75c to 2.90c
Boat.....	3.00c
Track bolts, all sizes, per 100 count.....	70 per cent off list
Machine bolts, 100 count.....	70 per cent off list
Carriage bolts, 100 count.....	70 per cent off list
Nuts, all styles, 100 count.....	70 per cent off list
Large rivets, base per 100 lb.....	\$3.00
Wire, black, soft ann'd, base per 100 lb.....	2.75
Wire, galv. soft, base per 100 lb.....	3.20
Common wire nails, per keg.....	2.35
Cement coated nails, per keg.....	2.35
On plates, structural bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.	

CHICAGO

Base per Lb.	
Plates and structural shapes.....	3.00c
Soft steel bars.....	2.75c
Reinforcing bars, blue steel.....	1.65c to 1.75c
Rail steel reinforcement.....	1.45c
Cold-fn. steel bars and shafting.....	3.00c
Rounds and hexagons.....	3.00c
Flats and squares.....	3.50c
Bands, 1/2 in. (in Nos. 10 and 12 gages).....	2.95c
Hoops (No. 14 and higher).....	2.50c
Hot-rolled annealed sheets (No. 22).....	3.55c
Galv. sheets (No. 24).....	4.10c
Hot-rolled sheets (No. 10).....	3.20c
Spikes (1/2 in. and lighter).....	3.45c
Track bolts.....	4.30c
Rivets, structural.....	3.75c
Rivets, boiler.....	3.75c
Per Cent Off List	
Machine bolts.....	70
Carriage bolts.....	70
Cash and lag screws.....	70
Hot-pressed nuts, sq., tap. or blank.....	70
Hot-pressed nuts, hex., tap. or blank.....	70
Hex. head cap screws.....	70
Cup point set screws.....	70 and 10
Flat head bright wood screws.....	52 1/2
Spring cotter.....	60
Stove bolts.....	80
Rd. hd. tank rivets, 7/16 in. and smaller.....	65
Wrought washers.....	\$4.50 off list
No. 8 black ann'd wire, per 100 lb.....	\$3.45
Com. wire nails, base per keg.....	2.30
Cement c'd nails, base per keg.....	2.30

NEW YORK

Base per Lb.	
Plates and struc. shapes.....	2.75c to 3.10c
Soft steel bars, small shapes.....	2.70c to 3.10c
Iron bars.....	3.24c
Iron bars, Swed. charcoal.....	6.00c to 6.50c
Cold-fn. shafting and screw stock.....	3.39c
Rounds and hexagons.....	3.39c
Flats and squares.....	3.89c
Cold-roll. strip, soft and quarter hard.....	4.95c
Hoops.....	3.30c
Bands.....	3.30c
Hot-rolled sheets (No. 10).....	3.25c
Hot-rolled ann'd sheets (No. 24).....	3.50c
Galvanized sheets (No. 24).....	4.00c
Long term sheets (No. 24).....	4.50c
Standard tool steel.....	12.00c
Wire, black annealed (No. 10).....	3.60c
Wire, galv. annealed (No. 10).....	4.05c

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel.....	\$3.35 to \$3.50
Scrap rails.....	3.35 to 3.50
Machine shop turnings.....	0.80 to 1.00
Cast iron borings.....	1.05 to 1.20
Bundled skeleton, long.....	2.00 to 2.10
Forge flashings.....	3.00 to 3.50
Blast furnace scrap.....	0.90 to 1.00
Leadsheet scrap.....	3.00 to 3.25
Shafting.....	3.50 to 10.00
Steel car axles.....	9.00 to 9.50
Wrought pipe.....	4.00 to 4.25
Rails for rolling.....	4.50 to 5.00
Cast iron borings, chemical.....	7.00 to 7.25
Per gross ton delivered consumers' yards:	
Textile cast.....	\$7.00 to \$7.50
No. 1 machinery cast.....	7.50 to 8.00
Stove plate.....	5.00 to 5.25
Railroad malleable.....	10.50 to 11.00

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel.....	\$4.50 to \$5.00
Scrap rails for melting.....	5.00 to 5.50
Leadsheet clippings.....	1.00 to 1.50
Bundled sheets.....	3.25 to 3.75
Cast iron borings.....	2.75 to 3.25
Machine shop turnings.....	2.50 to 3.00
No. 1 busheling.....	3.75 to 4.25
No. 2 busheling.....	2.00 to 2.50
Rails for rolling.....	6.00 to 6.50
No. 1 locomotive tires.....	7.00 to 7.50
Short rails.....	8.00 to 8.50
Cast iron car wheels.....	6.00 to 6.50
No. 1 machinery cast.....	7.50 to 8.00
No. 1 railroad cast.....	7.00 to 7.50

Warehouse Prices for Steel Products

Tire steel, 1/4 x 1/4 in. and larger.....	3.40c
Smooth finish, 1 to 2 1/2 x 1/4 in. and larger.....	3.75c
Open-hearth spring steel, base.....	4.50c to 7.00c
Common wire nails, base, per keg.....	\$2.60
Per Cent Off List	
Machine bolts, cut thread:	
1 x 6 in. and smaller.....	.65 to .65 and 10
1 x 30 in. and smaller.....	.65 to .65 and 10
Carriage bolts, cut thread:	
1/2 x 6 in. and smaller.....	.65 to .65 and 10
1/2 x 20 in. and smaller.....	.65 to .65 and 10
Boiler Tubes.....	Per 100 Ft.
Lap welded, 2-in.....	\$18.05
Seamless welded, 2-in.....	19.24
Charcoal iron, 2-in.....	24.34
Charcoal iron, 4-in.....	63.65
*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.	

ST. LOUIS

Base per Lb.	
Plates and struc. shapes.....	3.25c
Bars, soft steel or iron.....	3.00c
Cold-fn. rounds, shafting, screw stock.....	3.36c
Hot-rolled annealed sheets (No. 24).....	3.80c
Galv. sheets (No. 24).....	4.35c
Hot-rolled sheets (No. 10).....	3.45c
Black corrug. sheets (No. 24).....	3.85c
Galv. corrug. sheets.....	4.00c
Structural rivets.....	4.00c
Boiler rivets.....	4.00c
Per Cent Off List	
Tank rivets, 1/2 in. and smaller, 100 lb. or more.....	.65
Less than 100 lb.....	.60
Carriage bolts.....	.70
Lag screws.....	.70
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more.....	.70
Less than 200 lb.....	.60
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more.....	.70
Less than 200 lb.....	.60

PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier.....	2.10c
*Structural shapes (higher).....	2.10c
*Soft steel bars, small shapes, iron bars (except bands).....	2.10c
Reinforce. steel bars, sq., twisted and deform.....	2.30c
Cold-fn. steel, rounds and hex.....	3.35c
Cold-fn. steel, sq. and flats.....	3.85c
*Steel hoops.....	2.65c
*Steel bands, No. 12 to 3/16 in. incl.....	2.40c
Spring steel.....	5.00c
Hot-rolled annealed sheets (No. 24).....	3.55c
Galvanized sheets (No. 24).....	3.75c
*Hot-rolled and annealed sheets (No. 10).....	2.55c
Diam. pat. floor plates, 1/4 in.....	5.00c
Swedish iron bars.....	5.60c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices for 15,000-lb. orders; extra apply for smaller quantities.

CLEVELAND

Base per Lb.	
Plates and struc. shapes.....	2.95c
Soft steel bars.....	2.75c
Reinforce. steel bars.....	1.75c to 1.95c
Cold-fn. rounds and hex.....	2.95c
Cold-fn. flats and sq.....	3.45c
Flat rolled steel under 1/4 in.....	3.00c
Cold-finished strip steel (No. 24).....	3.25c
Galvanized sheets (No. 24).....	3.75c
Hot-rolled sheets (No. 10).....	3.00c
Black ann'd wire, per 100 lb.....	\$2.75
No. 9 galv. wire, per 100 lb.....	3.20
Com. wire nails, base per keg.....	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

Base per Lb.	
Plates and struc. shapes.....	3.25c
Bars, soft steel or iron.....	3.00c
Low billet reinforce. bars.....	3.00c

Burnt cast.....	3.25 to 3.75
Stove plate.....	3.25 to 3.75
Agricultural malleable.....	6.50 to 7.00
Railroad malleable.....	7.00 to 7.50

DETROIT

Dealers' buying prices per gross ton:	
Hvy. melting steel.....	\$4.25 to \$4.75
Borings and short turnings.....	1.50 to 2.00
Long turnings.....	1.00 to 1.50
No. 1 machinery cast.....	7.00 to 7.50
Automotive cast.....	8.50 to 9.00
Hydraul. comp. sheets.....	3.25 to 3.75
Stove plate.....	3.25 to 3.75
New No. 1 busheling.....	3.25 to 3.75
Old No. 2 busheling.....	1.25 to 1.75
Sheet clippings.....	1.25 to 1.75
Flashings.....	3.50 to 4.00

(F.o.b. Pittsburgh or Youngstown)	
	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods	
(Common soft, base)	
	Per Gross Ton
Pittsburgh	\$37.00
Cleveland	37.00
Chicago	38.00

COKE, COAL AND FUEL OIL

Coke	
	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$2.00 to \$2.15
Foundry, f.o.b. Connellsville prompt	3.00 to 4.25
Foundry, by-product, Chicago ovens, for delivery outside switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd.	8.50 to 9.00
Foundry, by-product, Phila. delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b., ovens	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal	
	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.20 to \$1.30
Mine run coking coal, f.o.b. W. Pa.	1.30 to 1.40
Gas coal, %-in., f.o.b. Pa. mines	1.30 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.30 to 1.40
Steam slack, f.o.b. W. Pa. mines	0.50 to 0.65
Gas slack, f.o.b. W. Pa. mines	0.50 to 0.65

Fuel Oil	
	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	2.65c.
No. 5 industrial fuel oil	2.45c.
Per Gal. f.o.b. Cleveland	
No. 3 industrial fuel oil	4.62 1/2c.
No. 4 distillate	4.00c.

REFRACTORIES

Fire Clay Brick	
	Per 1000 f.o.b. Works
High-heat intermediate	
Duty Brick	Duty Brick
Feen	\$35.00 \$25.00 to \$30.00
Maryland	35.00 25.00 to 30.00
New Jer.	\$44.00 to \$7.00
Ohio	35.00 25.00 to 30.00
Kentucky	35.00 25.00 to 30.00
Missouri	35.00 30.00
Illinois	35.00 25.00 to 30.00
Ground fire clay, per ton	6.50

Chrome Brick	
	Per Net Ton
Standard size	\$42.50

Silica Brick	
	Per 1000 f.o.b. Works
Pennsylvania	\$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick	
	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$61.50
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.90

CAST IRON PIPE

	Per Net Ton
4-in. and larger, del'd Chicago	\$34.40 to \$38.40
4-in. del'd Chicago	37.40 to 41.40
4-in. and larger, del'd New York	31.30
4-in. del'd New York	34.30
4-in. and larger, Birm'ham	\$32.00 to 33.00
4-in. Birmingham	35.00 to 36.00

Class "A" and gas pipe, \$3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per gross ton, f.o.b. Valley furnace:	
Basic	\$13.50
Bessemer	15.00
Gray forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	\$14.50 to 15.00
Low phos., copper free	25.00

Freight rate to Pittsburgh or Cleveland district, \$1.89.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:	
Basic	\$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.00

Freight rates to points in Pittsburgh district range from 69c. to \$1.26.

CHICAGO

Per gross ton at Chicago furnace:	
N't'n No. 2 fdy.	\$15.50
N't'n No. 1 fdy.	16.00
Malleable, not over 2 1/2 sil.	15.50
High phosphorus	15.50
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, Copper free	27.50
Silvery, sil. 8 per cent.	23.87
Basic, ferroal'n, 15 per cent.	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:	
No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	\$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	\$18.30 to 18.80
Southern No. 2 fdy., del'd	14.56
Northern malleable, del'd	18.30 to 18.80
Northern basic, del'd	18.30 to 18.80

Freight rates \$3c. (average) Granite City to St. Louis; \$2.30 from Chicago; \$4.56 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:	
*Buffalo, No. 2, del'd east	
N. J.	\$17.41 to \$17.66
East Pa. No. 2 fdy.	15.03 to 15.52
East Pa. No. 2X fdy.	15.52 to 16.03

Freight rates: \$1.52 to \$2.63 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of \$3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:	
No. 2 fdy.	\$16.00
No. 2X fdy.	16.50
No. 1 fdy.	16.50
Malleable, sil. up to 2.25	17.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

NEW ENGLAND

Per gross ton delivered to most New England points:	
*Buffalo, sil. 1.75 to 2.25	\$19.04 to \$20.04
*Buffalo, sil. 2.25 to 2.75	19.04 to 20.04
*Buffalo, sil. 1.75 to 2.25	17.41 to 18.91
*Buffalo, sil. 2.25 to 2.75	17.41 to 18.91
*Ala., sil. 1.75 to 2.25	19.74
*Ala., sil. 2.25 to 2.75	20.24
*Ala., sil. 1.75 to 2.25	15.88
*Ala., sil. 2.25 to 2.75	16.28

Freight rates: \$5.65 all rail from Buffalo, and \$3.41 to \$3.91 rail and water from Buffalo when \$1 barge and \$2 to \$2.50 New England freight rate are obtainable; \$9.75 all rail from Alabama and \$5.88 rail and water from Alabama to New England seaboard.

*All-rail rate.

*Rail-and-water rate.

CINCINNATI

Per gross ton, delivered Cincinnati:	
Ala. fdy., sil. 1.75 to 2.25	\$13.83
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N't'n No. 2 foundry	\$17.01 to 17.59
S't'n Ohio silvery, 8%	21.02

Freight rates: \$2.02 from Ironton and Jackson, Ohio; \$3.82 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:	
East. Pa. No. 2	\$14.34 to \$14.84
East. Pa. No. 2X	14.84 to 15.34
East. Pa. No. 1X	13.84 to 14.34
Basic (del'd east. Pa.)	14.50 to 15.00
Malleable	17.50 to 18.00
Stand. low phos. (f.o.b. east. Pa. furnace)	20.50 to 21.50
Cop. br'g low phos. (f.o.b. furnace)	20.50 to 21.50

Va. No. 2 plain	21.54 to 22.04
Va. No. 2X	22.04 to 22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: \$4c. to \$1.79 from eastern Pennsylvania furnaces; \$4.67 from Virginia furnaces.

CLEVELAND

Per gross ton at Cleveland furnace:	
N't'n No. 2 fdy. (local delivery)	\$15.50
S't'n fdy. sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.50
Ohio silvery, 8 per cent.	21.87
Stand. low. phos., Valley	23.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 55c. average local switching charge; \$3.12 from Jackson, Ohio; \$6.14 from Birmingham.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:	
No. 2 fdy., 1.75 to 2.25 sil.	\$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

CANADA

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$22.00
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	\$23.00 to \$23.50

Ferromanganese

Per Gross Ton	
Domestic, 80%, seaboard	\$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	68.00

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegelstein

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$25.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$77.50
50% (less carloads)	85.00
75% (carloads)	126.00
75% (less carloads)	136.00
14% to 16% (f.o.b.) Welland, Ont., in carloads	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	Per Gross Ton
10%	\$20.50
11%	21.00
12%	21.50
13%	22.00
14%	22.50
15%	23.00
16%	23.50
17%	24.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	Per Gross Ton
6%	\$18.00
7%	18.50
8%	18.75
9%	19.00
10%	19.50
11%	20.00
12%	20.50
13%	21.00
14%	21.50
15%	22.00
16%	22.50
17%	23.00

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	\$1.08
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Ferrotungsten, less carloads	\$1.10 to 1.20
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	10.00c.
Ferrocromium, 2% carbon	17.00c. to 17.50c.
Ferrocromium, 1% carbon	19.00c. to 20.00c.
Ferrocromium, 0.10% carbon	23.50c. to 25.00c.
Ferrocromium, 0.06% carbon	25.50c. to 27.00c.
Ferrovandium, del., per lb. contained Va.	\$3.05 to \$3.30
Ferrocobaltium, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 13% Rockdale, Tenn., base	68.00
Ferromolybdenum, per lb. Mo., del.	85c.
Calcium molybdate, per lb. Mo., del.	80c.
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton	\$91.00
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	\$4.80
Old range non-Bessemer, 51.50% iron	4.85
Mesabi Bessemer, 51.50% iron	4.95
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68% iron	9.00c.
Iron, basic or foundry, Swedish, average 65% iron	8.00c.
Iron, basic or foundry, Russian, aver. 62% iron (nom.)	9.00c.
Manganese, Caucasian, washed 52% 24.00c.	
Manganese, African, Indian, 55 to 58%	23c. to 24c.
Manganese, Brazilian, 46 to 48%	21c. to 22c.

Per Gross Ton

Tungsten, Chinese wolframite	\$10.75 to \$11.00
Tungsten, domestic scheelite	\$10.00 to 10.50
Chrome, 45%, Cr2O3, crude, c.i.f. Atlantic seaboard	18.00
Chrome, 48%, Cr2O3, c.i.f. Atlantic seaboard	20.00

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	\$17.31
No. 2 lump, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	19.31
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid, \$16.00 to Domestic, No. 1 ground bulk, 85 to 88% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$8.00 to \$9.00
No. 2 heavy melting steel	6.50 to 7.00
No. 2 railroad wrought	8.00 to 8.50
Scrap rails	8.00 to 8.50
Rails 3 ft. and under	10.50 to 11.00
Sheet bar crops, ordinary	9.00 to 9.50
Compressed sheet steel	7.00 to 7.50
Hand bundled sheet steel	6.50 to 7.00
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	5.00 to 5.50
Short shov. steel turnings	5.00 to 5.50
Short mixed borings and turnings	5.00 to 5.50
Cast iron borings	5.00 to 5.50
Cast iron wheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	9.00 to 10.00
Rail. knuckles and couplers	8.50 to 9.00
Rail. coil and leaf springs	8.50 to 9.00
Roller steel wheels	8.50 to 9.00
Low phos. billet crops	10.50 to 11.00
Low phos. sheet bar crops	10.50 to 11.00
Low phos. plate scrap	9.00 to 9.50
Low phos. punchings	9.00 to 9.50
Steel car axles	10.00 to 10.50

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton	
Heavy melting steel	\$5.50 to \$6.00
Shoring steel	5.50 to 6.00

Frogs, switches and guards	5.50 to 6.00
Hydraulic comp. sheets	3.50 to 4.00
Drop forge flashings	3.50 to 4.00
No. 1 busheling	3.00 to 3.50
Roller car wheels	6.50 to 7.00
Railroad tires	6.50 to

PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Trade Still in Doldrums

IMPROVED sentiment in business circles has had no visible effect in stimulating machine tool orders or inquiries. In all of the principal industrial centers the markets remain as dull as they were in July. This is to be expected, of course, until the improvement in confidence has been translated into orders for goods

that require machine tools for their manufacture. Although some metal-working plants have had increases in business, the gains are scattered and of such small aggregate volume that the long-delayed decisions to re-equip with modern tools are not yet forthcoming.

There is speculation as to the

Midsummer Quiet Prevails in All Market Centers with No Immediate Change in Sight

amount of new equipment that the automobile industry may require in the early fall for the manufacture of new models. No inquiries have come out, and the machine tool industry is not looking for much demand from the motor car manufacturers until the volume of their business has again improved.

◀ NORTH ATLANTIC ▶

Board of Transportation, 250 Hudson Street, New York, asks bids until Aug. 26 for electric power equipment for Houston Street subway line of Independent City-Owned Rapid Transit Railroad System; until Aug. 16 for construction of Stanton power substation on Essex Street. John H. Delaney is chairman.

Standard Brands, Inc., 595 Madison Avenue, New York, has authorized an expansion and improvement program at Fleischmann yeast works, Peekskill, N. Y., including construction of new battery of 12 copper fermenting units with copper piping and other equipment. Program estimated to require about 500,000 lb. copper and to take about a year for completion. Cost over \$400,000. Company has acquired six-story building at 2133 Pershing Road, Chicago, and will equip with machinery for new coffee-roasting plant, including conveying, packing and mechanical-handling equipment.

Philros Sheet Metal Works, Inc., Bronx, New York, recently organized, has leased space in factory at Lincoln Avenue and 133rd Street, and will occupy for new plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 23 for one gasoline engine-driven arc welding set (Schedule 8507) for Brooklyn Navy Yard.

United Auto Spring Co., of Bronx, Inc., Bronx, New York, has been organized by A. Benjamin Friedman and Harvey B. Ehrlich, 6 East Forty-fifth Street, Manhattan, to take over and expand United Auto Spring Co., 1612 Webster Avenue, Bronx, maker of automobile springs, coil springs, etc.

Board of Education, Park Avenue and Fifty-ninth Street, New York, plans manual training department in new four-story school on Seward Avenue, Bronx, for which building permit has just been issued. Cost about \$600,000. Walter C. Martin is architect for board.

Peerless Iron Works, 111 East 131st Street, New York, has leased building at 1945 Park Avenue, and will occupy for plant.

International Business Machines Corp., 270 Broadway, New York, has concluded arrangements for purchase of counting and weighing machine division of National Scale Corp., Plymouth Street, Chicopee Falls, Mass., and will consolidate with its line of production. Acquired units will be removed to plant of purchasing company at Endicott, N. Y., where erection recently was started on two new units.

Arenco Machine Co., New York, has been organized by Roy Johnson and F. Atterberg, 225 Central Park West, with capital of \$305,000, to take over and expand company of same name at 25 West Forty-third Street, manufacturer of machinery and other mechanical equipment.

Iroquois Pulp & Paper Co., Thomson, N. Y., has resumed operations on regular production schedule, recalling full force of 100 men.

Amitin Iron Furnishings, Inc., Brooklyn, has been organized by Harry Amitin, 1665 Davidson Avenue, and associates, to manufacture iron products. New company said to be planning to take over and expand iron works heretofore operated under name of Alexander Amitin, 269 Meserole Street.

Royal Typewriter Co., Inc., 2 Park Avenue, New York, is increasing production schedule at plant at Hartford, Conn., with substantial additions to working force. Bulk of output is given over to new model portable typewriter.

Electro-Gear Corp., 277 Coit Street, Irvington, N. J., manufacturer of automobile gears and equipment, has plans for a one-story addition to cost about \$30,000 with equipment. A. H. Henland is president.

Elizabeth Sash, Door & Supply Co., Seventh and Livingston Streets, Elizabeth, N. J., plans rebuilding of four-story plant, including wood-working mill and other units, recently destroyed by fire. Loss about \$100,000 with equipment.

Newark Galvanizing Co., Inc., 25 Verona Avenue, Newark, is running on full-time production schedule, giving employment to close to normal working quota. Company has secured renewal of contract with Brooklyn Navy Yard for annual requirements of hot-dip galvanizing with increased tonnage. It is a subsidiary of Atlas Fence Co., same address.

Fader Cornice & Roofing Works, Inc., East Orange, N. J., has been organized by Vivian Fader and associates to take over and expand company of same name at 12 Hedden Place, manufacturer of sheet metal products.

H. Delle, 84 Jackson Street, Hoboken, N. J., meat packer, has awarded general contract to C. V. Daniels & Co., 449 West Twenty-eighth Street, New York, for one-story addition, including refrigerating unit. Cost about \$30,000 with equipment.

Richardson & Boynton Co., 244 Madison Avenue, New York, household heating apparatus, will resume operations at plant at Dover, N. J., Aug. 15, following a suspension of about six weeks, giving employment to approximately 200 workers.

Seatrains Lines, Inc., 11 Broadway, New York, has begun work on new terminal for railroad car service, foot of Fourteenth Street, Hoboken, N. J., to include freight-handling and loading facilities, mechanical-handling equipment, etc. Estimated cost over \$85,000. Company is scheduling completion late in fall. It is affiliated with Hoboken Manufacturers Railroad Co., Fifth Street and River Road, Hoboken.

John A. Roebling's Sons Co., Trenton, N. J., wire rope and cable, cableways, etc., has

awarded general contract to J. A. Reading, 315 Ardmore Avenue, for one-story addition on Mott Street, for storage and distributing service.

Continental Can Co., 1 Pershing Square, New York, is advancing operations at tin can plant at Camden, N. J., adding about 75 men to working force, about 150 additional workers to be added at early date.

United States Pipe & Foundry Co., East Burlington, N. J., is making improvements in power department, to include installation of switching, control and other electrical equipment, following recent fire in power station with loss of about \$20,000.

Department of Supplies and Purchases, City Hall Annex, Philadelphia, Joseph H. Hagedorn, director, asks bids until Aug. 15 for iron castings (Class 239), and repair parts for grates (Class 240).

Molded Insulation Co., Inc., 3246 Ludlow Street, Philadelphia, manufacturer of airplane parts, etc., has leased entire floor of adjoining factory at 3248 Ludlow Street, 6500 sq. ft. floor space, and will occupy at once.

Chewing Gum Machinery Corp., Philadelphia, has been organized by J. Warren Bowman, Narbeth, Pa., and Walter T. Fahy, 6520 Wissahickon Avenue, Philadelphia, to manufacture special machinery and parts.

Atlas Portland Cement Co., 125 East Forty-second Street, New York, will resume operations at mill at Catsaquia, Pa., Aug. 15, with sizable working force, following shut-down of a number of weeks.

Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, has taken title to group of factory buildings at Frankford Avenue and Wilkey Street, Philadelphia, to be occupied in near future.

Bowers Battery Co., Reading, Pa., electric batteries for automobile and other service, is running on capacity schedule of three eight-hour shifts per day, six-day week. Orders for present month are 77 per cent over those for August of last year.

Hercules Powder Co., Delaware Trust Building, Wilmington, Del., is planning expansion and improvement program at power plant at works at Kenvil, N. J., including installation of new high-pressure steam turbine unit and accessories, two 500-hp. steam boilers and auxiliary equipment. Cost over \$125,000 with equipment. George E. Ramer is chief engineer for company.

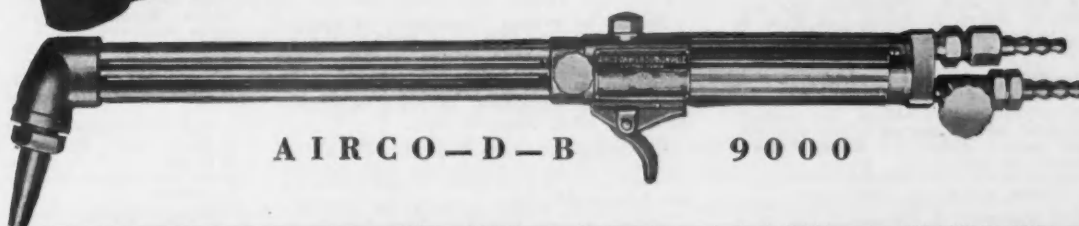
Victory Products Corp., Gettysburg, Pa., manufacturer of rubber products, has resumed operations at mill, following shut down of several months, giving employment to about 100 workers.

Brockway Motor Co., Inc., Cortland, N. Y., recently organized, will take over and succeed to Brockway Motor Truck Corp., manufac-

FIELD REPORT

While inspecting welding operations of the ----- Construction Company, Noted that an air drill was being set up to drill bolt holes between two 10" I beams. Asked the superintendent why a drill was to be used rather than a cutting torch which would save a great deal of time, and was told that torch could not be operated between the beams which were set only 1 1/4" apart. Secured permission to demonstrate use of the Airco-D-B-9000 cutting torch under these special conditions. Bent tubes on a "9000," from my kit, to the proper angle and was able to give them a torch that would handle the job. Results were entirely satisfactory and considerable time will be saved on the contract. The superintendent registered these results with the purchasing agent who gladly issued an order for the time-saving apparatus. (Note for Mr. Salisbury (manager) Here is another company that now knows that we really mean what we say about A.E.D. Service.)

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A NATION-WIDE WELDING SUPPLY SERVICE

turer of motor trucks and parts. R. F. Black, president of former company, will be an official of new organization.

Remington Typewriter Co., Syracuse, N. Y., has resumed operations at local plant after short curtailment, giving employment to about 600 workers.

Buffalo Aeronautical Corp., Buffalo, has been organized by William C. Warren, Jr., East Aurora, N. Y., and Gibson Gardner, 232 Lincoln Parkway, to manufacture airplanes and parts.

H. W. Knight & Son, Inc., Seneca Falls, N. Y., pattern letter manufacturer, has purchased the pattern letter business formerly conducted by A. W. Brim Co. of the same city.

◀ CENTRAL DISTRICT ▶

H. C. Frick Coke Co., Carnegie Building, Pittsburgh, has made application to United States Engineer Office for permission to make improvements in dock river loading plant at Palmer, Monongahela River.

J. H. Kim Co., 181 Forty-first Street, Pittsburgh, manufacturer of food products, plans rebuilding of portion of plant, recently destroyed by fire. Loss over \$80,000 with equipment.

Adams Electrical Mfg. Corp., Everett, Pa., has been organized by Irvin Adams and H. Vaughn Grove, both Everett, to manufacture electrical and mechanical equipment.

Copperweld Steel Co., Glassport, Pa., manufacturer of welded steel and copper products, is running on full-time production schedule, following receipt of Government order for copperweld product for use in flood control work on Mississippi River. Similar order has been secured by American Steel & Wire Co., Donora, Pa., which will advance operations at once. Estimated requirements total about 10,000,000 lb. from both plants.

Penn Central Light & Power Co., Altoona, Pa., will carry out expansion and improvement program in Pleasant Valley district, including new substation equipment, transmission and distributing lines. Cost over \$150,000.

Dravo Contracting Co., Neville Island, Pittsburgh, has submitted low bid to United States Engineer, Huntington, W. Va., for construction of dam on Kanawha River, near Marmet, W. Va., at \$876,375, using all-structural steel for roller gates, and \$921,375, using roller gates of structural steel and wrought iron, and is expected to receive award on either of two propositions. Installation will include steel service bridge equipped with revolving crane on top chords and bridge crane on lower chords, electric hoists and other electrical and mechanical equipment.

Baker Truck Co., Lewistown, Pa., has been organized by John T. Miller and William C. Baker, 424 East Walnut Street, to manufacture motor truck and trailer equipment, parts, etc.

City Council, Wellsville, Ohio, is considering construction of a municipal hydroelectric power plant, in conjunction with extensions in municipal water system and new filtration plant. Estimated cost \$500,000 with equipment. Mayor George D. Ingram is at head of project. H. H. Whitacre is engineer.

Columbus Stoker, Inc., Columbus, Ohio, care of R. E. Lamm, A. I. U. Building, has been organized by Harry Browning and Paul H. Schultz, to manufacture stokers and kindred power plant equipment.

Quartermaster, Patterson Field, Dayton, Ohio, will have plans in near future for proposed expansion program of War Department at local field, estimated to cost \$266,000, approval recently given by Congress. Work will include hangar units, repair and reconditioning shops, headquarters and operations building, and steam power plant.

Belmont Stamping & Enameling Co., New Philadelphia, Ohio, has resumed operations, following shutdown since last April, reinstating normal working force of about 300.

Department of Public Works, Division of Highways, City Hall, Cincinnati, soon takes bids on general contract for one-story addition to mechanical repair shop on Bates Alley. Charles E. Brokaw is superintendent.

Contracting Officer, Materiel Division, Wright Field, Dayton, Ohio, asks bids until Aug. 15 for about 703,000 aluminum alloy plain washers (Circular 28), 12,000 hose clamps (Circular 37); until Aug. 17 for six single-faced racks (Circular 38); until Aug. 22 for 20-stand reel drive film-winding shaft assemblies, and 20-stand reel drive shaft film-winding ratchets (Circular 33); until Aug. 24 for 250 tube assemblies, 250 extension assemblies, 250 brackets, 250 gun blast tube bracket lugs, clamps, etc. (Circular 30).

Mullins Mfg. Corp., Mill Street, Salem, Ohio, manufacturer of automobile bodies, fenders, metal washing-machine tubs, etc., is increasing operating schedule, with additional employees in die, tool and other departments. Company has recently secured volume of orders totaling \$700,000 for different products.

Rusch Nut & Mfg. Co., Cleveland, care of E. A. Esper, 4217 Denison Avenue, has been organized by E. H. Jacobson and L. N. Dumoulin, Cleveland, to manufacture nuts, bolts and kindred specialties.

Fort Recovery Stirrup Mfg. Co., Fort Recovery, Ohio, manufacturer of stirrups, automobile equipment, etc., plans rebuilding of portion of plant recently destroyed by fire. Loss about \$35,000 with equipment.

Cincinnati Union Terminal Co., Temple Bar Building, Cincinnati, has let contract to Ogle Construction Co., 28 East Jackson Boulevard, Chicago, for coal and ash-handling plant for new power station at Union Terminal, to cost about \$48,000.

City Auto Stamping Co., Lint Avenue, Toledo, Ohio, manufacturer of automobile radiator shells, fenders and other automotive equipment, is resuming operations following shutdown of several weeks.

Franklin County Board of Commissioners, Brookville, Ind., soon asks bids for a vacuum pump and other equipment for steam power station. Harrison & Turnock, Architects and Builders Building, Indianapolis, are consulting engineers.

Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Chicago, has increased operations to a full shift schedule at car repair shops at Terre Haute, Ind., giving employment to about 120 men.

Excel Mfg. Corp., Muncie, Ind., has been organized by James H. Reichart and Thomas G. O'Meara, Muncie, to manufacture automobile equipment and accessories.

Delco-Remy Corp., Anderson, Ind., manufacturer of automobile starting and lighting equipment, a subsidiary of General Motors Corp., Detroit, has advanced production schedule and increased working force to more than 6000.

Lever Brothers Co., Hammond, Ind., manufacturer of soaps, washing powders, etc., with headquarters at 164 Broadway, Cambridge, Mass., has superstructure under way on four-story addition to Hammond plant, to include extensions in power department. Cost about \$400,000 with equipment. Stone & Webster Engineering Corp., 49 Federal Street, Boston, engineer.

Hollman-Wolf Corp., Fort Wayne, Ind., has been organized by Charles and William Hollman, and Herbert Wolf, Fort Wayne, to manufacture machinery and parts.

George M. Peet Packing Co., Chesaning, Mich., meat packer, is planning extensions and improvements in branch plant at Bay City, Mich., including installation of new equipment. Cost about \$35,000.

McCord Radiator & Mfg. Co., 2587 East Grand Boulevard, Detroit, is increasing production schedule in automobile radiator division, stepping up from 1000 to 1500 radiator units daily.

Carson Cadillac Corp., Cadillac, Mich., has been organized by H. Y. Carson, Cadillac, and associates, to manufacture castings, bolts, gaskets and kindred mechanical products.

Bureau of Prisons, Department of Justice, Washington, asks bids until Aug. 16 for air compressor and tank, motor, electric panel board and controls; mechanical laundry equipment including drying tumbler, presses, two under-driven extractors, etc., for institution at Milan, Mich. (Schedule 737).

Union Steel Products Co., Albion, Mich., is increasing production schedule with adoption of night shift, adding about 50 men and making total of 350.

Watson & Rose Mfg. Co., 12400 Strathmore Street, Detroit, has been organized by Glenn A. Rose, 15905 Glastonbury Road, and associates, to manufacture factory trucks, castors, and kindred industrial-handling equipment.

Hersey Gravel Co., Evart, Mich., plans rebuilding of sand and gravel storage, loading and distributing plant, recently destroyed by fire. Loss about \$40,000 with equipment.

Eureka Vacuum Cleaner Co., Dewey and Hamilton Streets, Detroit, manufacturer of electric vacuum cleaners and parts, is resuming operations following curtailment of about a year. It is expected to develop capacity schedule in fall.

Robinson Ventilating Co., Zelienople, Pa., manufacturer of fans and blowers, has been placed in receivership pending a hearing in equity scheduled for Sept. 2. R. H. McClester and J. R. Robinson are receivers.

◀ MIDDLE WEST ▶

United States Engineer Office, 333 North Michigan Avenue, Chicago, asks bids until Aug. 18 for construction of Brandon Road junction lock, including steel mitre gates and other equipment (Circular 28).

Omaha Packing Co., 2320 South Halsted Street, Chicago, meat packer, plans rebuilding of plant destroyed by fire, Aug. 4. Loss over \$2,000,000 with equipment. Same fire also destroyed plant of Quincy Elevator, Twenty-second and Sangamon Streets, comprising complete grain elevator unit. Loss over \$500,000 with machinery.

Maas Metal Products Corp., 1480 Merchandise Mart, Chicago, has been organized by F. J. Maas, 31 North State Street, James H. Hicks and associates, to manufacture stainless brass and bronze products.

Village Council, Elk River, Minn., is selecting engineer to prepare plans for a municipal electric light and power plant and make surveys. Cost about \$35,000 with equipment. W. F. Chadborn is village clerk.

Edison General Electric Appliance Co., Inc., 5600 Taylor Street, Chicago, has secured contract for 1000 electric ranges for United States Army, for barracks and flying fields.

City Council, Englewood, Colo., has let general contract to Municipal Power Development Co., Pence Building, Minneapolis, Minn., for municipal electric light and power plant, one story, 80 x 100 ft., with three oil engines, generators, pumping station, elevated steel tank and tower, and other structures. Cost about \$600,000 with machinery.

City Council, Fargo, N. D., plans installation of tank, pumping machinery, water-softening equipment and other mechanical equipment in connection with extensions and improvements in municipal waterworks. Cost over \$90,000.

Sheridan Oil & Refining Co., Sheridan, Wyo., E. L. Newbury, president, has approved plans for new oil refining plant, to be equipped for handling about 300 bbl. crude oil daily. Cost over \$100,000 with machinery.

City Council, Sumner, Iowa, asks bids until Aug. 25 for municipal electric light and power plant, including Diesel engine-generating units and complete auxiliaries, switchboard, cooling and exhaust equipment, etc. Estimated cost about \$95,000. H. L. Cory Co., 3905 North Seventeenth Street, Omaha, Neb., is consulting engineer.

Board of Education, Niles Center, Ill., plans installation of manual training department in new school at Forest View Road and Davis Street, for which bids have been asked on general contract. Cost about \$75,000. Godfrey E. Larson, 5154 North Clark Street, Chicago, is architect.

Omaha Ice & Cold Storage Co., Omaha, Neb., plans rebuilding of portion of ice-manufacturing and cold storage plant, recently destroyed by fire. Loss about \$85,000 with machinery.

Multiklipper, Inc., 864 West North Avenue, Chicago, has been organized by William A. Peters and David James, to manufacture machinery and parts.

Berst-Forster-Dixfield Co., Cloquet, Minn., manufacturer of wood novelties and specialties, has awarded general contract to James Leck Co., 211 South Eleventh Street, Minneapolis, Minn., for three two-story and basement additions, 102 x 226 ft., 102 x 146 ft., and 81 x 102 ft., respectively. Cost over \$200,000 with machinery. Homan F. Hallock, Oswego, N. Y., is architect. Headquarters are in Grand Central Terminal Building, New York.

Sigwald Engineering Corp., 2937 Fourth Avenue South, Minneapolis, Minn., has been organized by G. S. Sigwald and associates, to manufacture oil burners and oil-burning equipment.

Young Radiator Co., Racine, Wis., announces the receipt of a large contract for oil temperature regulators for immediate delivery. This company also states that it is working on the production of units for car heaters, the largest order it has ever received for this commodity, which will bring steady production through the department manufacturing them for the next six months without interruption.

Sterling Motor Truck Co., 2021 South Fifty-fourth Street, Milwaukee, which recently acquired commercial motor truck division of LaFrance-Republic Corp., Alma, Mich., is consolidating operations at Milwaukee. Present floor space and equipment will suffice for the time being, according to E. M. Sternberg, president.

Board of Education, Oshkosh, Wis., E. G. Beardmore, secretary, is apportioning a small list of machinery for new Junior High School

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addition to Merrill School between Yates-American Machine Co., Beloit, Wis., and J. D. Wallace & Co., Chicago.

Westinghouse Electric Elevator Co., Chicago, has received contract for furnishing freight and passenger equipment for new Post Office at Minneapolis, Minn., at \$99,845. N. P. Severin Co., 222 West Adams Street, Chicago, is general contractor.

Worden-Allen Co., Milwaukee, is low bidder at \$58,436 for chlorinating station of new sewage disposal plant at Duluth, Minn. Other low bidders: sewage treatment plant, Phelps-Drake Co., Minneapolis, \$101,400; screening, digesting and chlorinating equipment, Dorr Co., Inc., Chicago, \$33,730. John Wilson is city engineer.

Kaukauna, Wis., City Water Commission has engaged Jerry Donohue Engineering Co., Sheboygan, Wis., to make survey and prepare cost estimates of proposed extensive enlargement of waterworks system. H. F. Weckwerth is superintendent.

◀ SOUTHWEST ▶

Current River Power Co., 605 R. A. Long Building, Kansas City, Mo., has preliminary surveys and plans under way by Holland, Ackerman & Holland, Inc., 20 North Wacker Drive, Chicago, consulting engineer, for power dam and hydroelectric generating station on Current River at Gartman Rock, about 1 mile from Doniphan, Mo., where power site has been secured. Dam will be 100 ft. high and 3000 ft. long; power plants will be equipped for capacity of 26,000 hp. It is understood that company under name of Doniphan Hydroelectric Co., will be organized to carry out project. E. B. Johnston is president. Entire development will cost over \$1,000,000 with transmission lines.

Board of Public Service, City Hall, St. Louis, asks bids until Aug. 23 for two-story and basement service and mechanical building, 125 x 250 ft., at Homer G. Phillips City Hospital for Colored, Whittier Street. Estimated cost over \$300,000 with equipment. Albert Osburg is city architect; L. R. Bowen is chief engineer, department of buildings and bridges. Work includes boiler plant, coal and ash conveyors, hot water generator, water-softening plant, etc.

Western States Grocery Co., Tulsa, Okla., has acquired building at 513 North Indiana Avenue, Oklahoma City, Okla., formerly occupied by Tennyson Sheet Metal Works, and will use for new storage and distributing plant. Company also planning for establishment of two other similar branches in western part of State, with conveying, loading and other mechanical-handling equipment.

Bureau of Prisons, Department of Justice, Washington, asks bids until Aug. 25 for second group of buildings at Southwestern Reformatory, El Reno, Okla., including power plant and other mechanical units, waterworks system, etc. An appropriation of \$700,000 has been arranged. Hawk & Parr, Oklahoma City Okla., are architects. Entire development will include additional groups, totaling 16 buildings, estimated to cost about \$3,000,000 with equipment.

Sewall Paint & Varnish Co., 1009 West Eighth Street, Kansas City, Mo., is completing plans for new one-story and basement plant, to replace unit destroyed by fire several weeks ago. Cost about \$30,000 with equipment. Hoyt, Price & Barnes, Telephone Building, are architects.

City Council, Pacific, Mo., has plans under way for a municipal electric light and power plant, with installation to include two 300-hp. generating units and auxiliary equipment. Cost about \$75,000 with machinery. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is consulting engineer.

Tulsa Steel Co., Inc., Tulsa, Okla., recently organized, will operate a general rolling mill at Sand Springs, Okla., in connection with acquisition of former bar mill at that place, announced in these columns last week, and will install additional equipment in different existing units. Company has started operations at 100-ton open-hearth furnace for ingot production, giving employment to about 100 men. Production has also begun in blooming mill and finishing plant, with other departments scheduled for early operation. Employment will be given to total working quota of about 250 men. L. W. Conroy is vice-president and general manager.

City Council, Goose Creek, Tex., has awarded contract to Municipal Telephone & Utilities Co., Pioneer Trust Building, Kansas City, Mo., for installation of a municipal electric light and power plant, including two electric generating sets, each of 750-hp. rating, and auxiliary equipment, with power substation, electric traveling crane and other machinery. Transmission lines will be built to furnish service

at Baytown and Pelly, Tex., in addition to Goose Creek. Cost about \$300,000 with machinery. R. E. McDonald is consulting engineer for contracting company.

Airport Committee, Duncan Field, San Antonio, Tex., plans rebuilding of airport buildings, including hangar, repair and reconditioning shop, recently destroyed by fire. Loss over \$80,000 with equipment.

Board of Trustees, University of Texas, Austin, asks bids until Aug. 15 for two turbo-generators, with exciters, surface condensers and complete auxiliary equipment for power plant on campus. C. J. Eckhart, Jr., is superintendent of power plant.

Texas Co-Operative Gin Co., Dallas, Tex., plans rebuilding of cotton ginning plant at Victoria, Tex., recently destroyed by fire. Loss over \$30,000 with machinery.

◀ SOUTH ATLANTIC ▶

Puritan Compressed Gas Co., Race and McComas Streets, Baltimore, manufacturer of commercial gases, has asked bids on general contract for one-story addition to plant. Cost reported over \$20,000 with equipment.

United States Engineer Office, Norfolk, Va., asks bids until Aug. 16 for one 20,000-gal. steel water tank at Great Bridge, Va. (Circular 776).

Howard A. Flagge Co., Inc., Norfolk, Va., has been organized by Howard A. Flagge, 3715 Colley Avenue, and associates, to manufacture oil burners and oil-burning equipment.

City Council, Columbia, S. C., is considering construction of a municipal electric light and power plant, to cost close to \$1,000,000 with equipment. Proposed to secure fund from Reconstruction Finance Corp. W. S. Tomlinson, city engineer.

United States Coast Guard Headquarters, Washington, asks bids until Aug. 15 for 170 drop-forged, finished shackles, and 170 shackle bolts for same; at same time, for 170 hoisting pads, machined and finished, and 170 pad pins for same.

Board of Broward County Port Commissioners, Fort Lauderdale, Fla., Thomas E. Swanson, chairman, is considering construction of an electric-operated pre-cooling and refrigerating plant on waterfront. Cost over \$40,000 with machinery.

Rife-Loth Corp., Waynesboro, Va., has been organized by R. H. Clemmer, Waynesboro, and associates, to take over and consolidate Loth Stove Co., with local plant for manufacture of electric stoves, parts, etc., and Rife Ram & Pump Works, Waynesboro, manufacturer of pumping machinery and kindred equipment. Expansion and development program will be carried out. Mr. Clemmer will be president and general manager of new company.

Bureau of Ordnance, Washington, asks bids until Aug. 17 for 3700 14-in. targets, 3400 8-in. targets, and 9000 common projectiles (Adv. 136).

W. J. Noble, Cartersville, Ga., has plans for an electric-operated ice-manufacturing plant, and plans early purchase of machinery for unit of about 10 tons per day capacity.

Texas Co., 135 East Forty-second Street, New York, has concluded arrangements for purchase of tract of waterfront property on Watson Bayou, Millville, Fla., and plans construction there of new bulk oil storage and distributing plant. Estimated cost over \$65,000 with tanks and equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 16 for one Diesel oil engine-driven alternator, one alternator switchboard panel, and two 75-hp. squirrel cage motors (Schedule 8473) for Sewalls Point, Va., Navy Yard; 20 control equipment motors, 20 control equipments and spare parts (Schedule 8462) for Norfolk, Va., Navy Yard; one filter plant (Schedule 8503) for Melville Navy Yard; until Aug. 19 for quantity of distance-reading tank gages (Schedule 900-5936); until Aug. 23 for approximately 35,000 lb. forged and rough machined steel forgings (Schedule 8496) for Washington Navy Yard; 72 electric forced-draft blowers and spare parts (Schedule 8501) for Brooklyn and San Diego Navy Yards; 35,000 zinc-base castings and 50,000 zinc-base castings (Schedule 8517) for Portsmouth, N. H., and Mare Island, Cal., Navy Yards, respectively; quantity of insulated wire and cable (Schedule 8487) for Eastern and Western yards; until Aug. 30 for one motor-driven shaper (Schedule 8500), one motor-driven centering machine (Schedule 8499), for one centrifugal pump (Schedule 8518), for New York or San Francisco Navy Yards.

Royal Quarrying & Mfg. Corp., Elberton, Ga., recently organized by Jose Canales, and

associates, plans development of granite quarry in this district, where tract of over 650 acres has been acquired. Also plans construction of one-story mill, for polishing, cutting and finishing operations.

Division of Supply, Treasury Department, Washington, asks bids until Aug. 16 for one hand-operated gasoline pump and for one 1000-gal. black steel tank (Proposal 755).

◀ SOUTH CENTRAL ▶

United States Engineer Office, Memphis, Tenn., asks bids until Aug. 17 for construction of one 160-ft. floating drydock at Memphis (Circular 51).

Board of City Commissioners, Gulfport, Miss., has authorized special election to vote bonds for \$150,000 for extensions and improvements in port, including construction of new buildings and cotton compress plant, installation of elevating, conveying, loading and other mechanical-handling equipment.

Swift & Co., Nashville, Tenn., and Union Stock Yards, Chicago, meat packers, have acquired plant of John Becker & Son, 1411 Church Street, Nashville, and will operate as new branch plant. Extensions and improvements will be made, with installation of additional equipment.

National Colorotype Co., Bellevue, Ky., manufacturer of enameled iron specialties, has secured contract from State of Delaware for automobile license plates for next year, and will advance production schedule.

Sewerage Commission, Baton Rouge, La., asks bids until Aug. 30 for pumping machinery and auxiliary equipment for sewerage pumping plant. L. J. Voorhies, Baton Rouge, is consulting engineer.

Board of City Commissioners, Middlesboro, Ky., has authorized a bond issue of \$300,000, fund to be used for construction of a municipal electric light and power plant.

American Paint Works, 428 Josephine Street, New Orleans, La., has awarded general contract to J. A. Haase, Jr., 916 Union Street, for two two-story additions to present five-story factory, 40 x 120 ft. and 40 x 100 ft., respectively. Cost about \$75,000 with equipment. Rathbone DeBuis, Hibernia Building, is architect.

◀ NEW ENGLAND ▶

Goodyear Tire & Rubber Co., Akron, Ohio, has leased new building to be erected at Bank Square, Waltham, Mass., for factory branch, storage and distributing plant. Cost over \$75,000 with equipment. Structure will be owned by Woodward & Tyler Co., Waltham.

Glenwood Range Co., Taunton, Mass., has resumed operations following extended shutdown, reinstating about 120 workers, of which about 80 men will be employed in foundry.

Farr & Read Co., Inc., Providence, has been organized by Harry B. Read and John M. Farr, 73 Lenox Avenue, to manufacture machinery and parts.

Transit Department, City of Boston, 1 Beacon Street, asks bids until Aug. 15 for mechanical ventilation building and adjuncts at 55-65 Liverpool Street, East Boston, for traffic tunnel service. Ernest R. Springer is chief engineer.

Cube Steak Machine Co., Boston, manufacturer of meat machines for meat markets, etc., has moved to 805 Albany Street, where space 12 times that of former location will be used. Expansion program will be carried out. Company has increased working force and is now employing larger quota than at any time in past three years.

Heany Transmission Co., Inc., Whitney Avenue, Hamden, Conn., has been organized by J. A. Heany, New Haven, Conn., and F. D. MacLaren, Hamden, to manufacture transmission equipment, transmission systems, etc.

Cities Service Refining Co., 260 Tremont Street, Boston, plans rebuilding of 55,000-bbl. oil tank and auxiliary equipment at refining plant, Quincy Avenue, East Braintree, Mass., recently destroyed by fire. Loss over \$60,000 with equipment.

Henry Cole Co., 54 Old Colony Avenue, South Boston, manufacturer of electrical equipment and parts, has arranged for purchase of plant and business of F. C. Hersee Co., 47 Bacon Street, Watertown, Mass., manufacturer of kindred products, and will consolidate with organization. Both plants will be continued in operation for time being, with possible concentration at one main unit in future.

Marquis Mfg. Co., Lynn, Mass., has been organized by Joseph E. and Edward S. Marquis, 91 Timson Street, to manufacture heating equipment and supplies.

THE DAY OF WROUGHT IRON



BLAST FURNACES which were few in number and primitive in character were sufficient to smelt all the iron which was consumed before modern methods of converting iron into steel were discovered around the middle of the last century. . . . Steel making was so laborious and expensive a process that wrought iron was more widely used. The skill of the iron worker came down through long generations from the armorer of old. . . . Many of the new devices he worked out to help him as he reheated and worked the

iron were most ingenious. Some live today in drawing and forging machinery. . . . Methods for making steel in quantities ushered in the beginning of the mechanical age. While steel often took the place of iron countless new uses for iron castings and malleables appeared and the demand for iron, both for steel mill and for foundry uses, grew rapidly. . . . When through the need for decreasing the cost of iron production pig iron and by-product coke became partners the benefits which were conferred on mankind were inestimable.

Interlake Iron Corporation serves the gray iron and malleable foundries of the agricultural implement, railroad equipment, machine tool, heating, automotive and other industries with pig iron to exact specifications. Its resources and capacity make it a most important source of supply to the essential industries of the country.

INTERLAKE IRON CORPORATION

PIG IRON / COKE

PICKANDS, MATHER & COMPANY, Sales Agents

CLEVELAND / CHICAGO / DETROIT / ERIE

Burning Fuel Oil at a Profit

(Concluded from page 212)

for other purposes. The worst method is to erect the storage tanks above ground exposed to wind and weather. In cold weather the radiation losses are enormous especially where oil is heated to 200 deg. F. and in addition there is the yearly expense of rust prevention. In the case of large tanks it may be more convenient to employ more heating and less protection, but in the long run, all-round economy suggests the use of insulation and weather protection.

In every case where the lift is not too great, all pipe connections should be at the top of the tank. It is a guard against leakage and extra expense which always results. At least one manhole should be provided and the tank vented with a small pipe to regulate automatically for the changing fuel level. Standard steel tanks of 10,000 gal. capacity are built of $\frac{3}{4}$ -in. plates for the shell and 5/16 in. thick for the heads.

An extra 1-in. pipe connection at one end of the tank provides a convenient means of connecting a perforated pipe for compressed air agitation, and if used at least once a week there will be no sludge accumulation of any amount, no matter how heavy the oil or high the viscosity. Extending the suction line to within 4 in. of the tank bottom will prove satisfactory especially with frequent air agitation. It is good practice to connect the return line at the end opposite the suction line. This method of connecting up insures a circulation within the tank and an actual workover of the surplus fuel pumped through the circulating line. The effect against sludge deposit is obvious.

Suction and Supply Lines

IDEAL conditions for oil lines from tank to pump are the right size or diameter, shortest possible length and the least number of bends and short radius fittings. With either top or bottom tank connection, care should be taken to insure absolutely tight joints and every part of the work strong and durable. Extra care in building this part of the system will repay the cost many times over. The actual suction pressure is no more than the partial vacuum developed by the pump minus the friction loss in pipe and fittings. A coarse screen in a convenient location for inspection and cleaning will prevent pump injury from material which may be carried along in the oil stream. Rotary pumps are best for handling these heavy fuels.

The main supply line from pump to burners should return to storage or auxiliary tank. A deadend line for carrying heavy oil is altogether out of place and no engineer of experience could indorse it.

The size of oil line depends on the volume of oil delivered, the length and the number of bends and fittings. Where the amount of oil pumped is double the maximum consumed, the following sizes have proved highly satisfactory and under a wide range of conditions: A 2-in. line for an hourly consumption of 600 gal.; 3-in. for 1200 gal.; 4-in. for 3000 gal. and 6-in. for 6000 gal. With these sizes and rates of flow, the pipe lines are kept free from sludge and other deposits and fairly insure the same mixture and structure at the last furnace as the first.

Building a good oil line means the care of seemingly small details and here is one of them. Never tap a main line at either the top or bottom in taking off a branch; use a side outlet. The heaviest part of the oil will naturally seek the lowest level, and the lighter portion, the top, while the average is found near the center and this portion is most likely to reach a branch supply when tapped from a side outlet.

Above or underground location of the oil line is usually settled on the basis of relative cost or convenience and ease of construction. There is no reason for under-floor lines except to reach an area distant from walls or other means of support. This is especially true of branches leading from the main line. The subsequent years of use will prove the good judgment of locating above ground and especially the circulating main. The older method of digging a trench and burying the line in cold damp clay and overheating the oil to keep it hot is both wasteful and destructive.

Either above or below ground the oil line should be insulated against loss of heat and if over 200 ft. in length, a steam line should parallel the oil line. Underground piping can be protected and insulated at a nominal cost by constructing a small tunnel of reinforced concrete arranged with concrete slab or steel covers and with ends closed to prevent air circulation. Oil lines above ground should also be insulated and provided with a 1-in. steam parallel line to prevent cooling of the oil on its way to the furnace.

A good method is to cover both pipes, as one, in a good grade of asbestos, air cell covering; and if exposed to the weather, protect with two layers of heavy tar paper, well tarred and secured by wiring or banding. When the shop is busy with a full schedule it is usually the time for finding weak spots. Careful attention in planning and working out the little details pays, not only in the end but all along the way.

In building the main circulating line, avoid sharp turns, keep the line

as straight and direct as possible. A few extra tees straight in the line may save labor and expense later on. There is no telling when a new furnace or different arrangement may be necessary. Always bring these fittings in position for side outlet and use a smaller outlet than the main line diameter. A shut down, a cold day and a gang of men digging up and thawing out of an oil pipe line are the best arguments for good construction.

What Pressures Should be Maintained

A part of the oil line equipment is the pressure regulator which may be located in any convenient place between the last furnace and the tank. There are a number of good regulating valves on the market but for reliability and long service no other device is superior to the gravity type and especially in contact with oil at high or fluctuating temperatures. The gravity valve is nothing more than the old weight and lever safety valve in common use on the steam boiler of fifty years ago. The force of gravity is constant, the mechanism is simplicity itself and these features make the regulator a most practical device.

What pressure should be maintained in the main oil line needs no other answer than the amount necessary to secure a free flow through main and distributing lines. If this can be done with 25 lb. per sq. in., all the better, as there is less danger of leakage, lower power consumption in pumping and better flow through the small regulating valves at the burners, especially with the use of oil containing untreated sludge particles. High oil pressure is absolutely unnecessary in a well designed and constructed line except where burners are used which require oil pressure in the atomizing process.

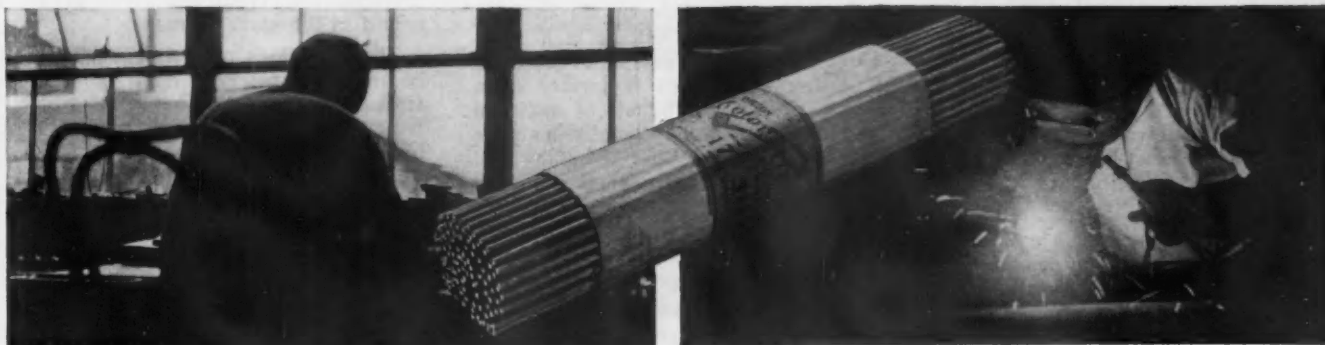
It is a common error to increase the oil pressure in order to force sludge particles through the small needle or other control valves. The higher the pressure the greater the flow and for a given quantity, the valve orifice must then be reduced and the effect is to obstruct greatly the passage of sludge. A better plan is to reduce the pressure and allow a larger valve opening.

Several years ago, the writer was called to a forge plant to observe conditions which led to clogging of valves to where furnace operation was almost impossible. The oil was of 18 Be. and at operating temperature, less than 250 seconds Saybolt Universal. Several tank cars had just been unloaded which agitated the sludge content of the storage tank and to the extent of mixing with fresh oil. When the valves were set for the lighter oil, the sludge particles could not pass through the small valve orifice. The regular oil pressure was 50 lb. per sq. in. which was increased to 120 lb., but it only made matters worse. Much better results were secured at 20 lb.

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WILSON

ARC-WELDING MACHINES AND WIRE

Die for Deep Drawing of Shells

(Concluded from Page 213)

the sleeve at *A* should have a generous radius and also the inside corner of draw ring *E* where the stock flows up over it. The screws *C* must be set exactly the same height all round to within a few thousandths of an inch; otherwise the stock will draw out longer on the one side than the other.

Base of Shell May Be Thicker than the Wall

Among other advantages this type of die has the valuable one of permitting a heavier blank to be used than the wall thickness of the shell calls for, because with the adjusting screws the stock can be reduced in thickness to whatever is required and held accurately at that thickness. This feature is advantageous where it is desired to have a heavier base on the shell than the wall thickness. All wearing parts must be extremely hard and polished to eliminate grinding scratches.

Fig. 3 is the same as Fig 2 except for the reduction in diameter, and Fig. 4 shows the fifth operation. The fourth operation is the same as the third; for the sake of brevity in this article it is not drawn up. The flange is obtained by shortening the length of stroke so the required length of flange is left, beginning with that shown in Fig. 3 and extended the desired length in the fourth operation, after which the flange is flattened out in the finishing, or fifth operation. In this last operation the knockout pad is also a forming pad, this being the only operation where the pad must be forced down on top of the die.

The Finishing of Rolls By Grinding

(Concluded from Page 219)

to 42 in. in diameter by 312 in. in body length, neck and drive portion to be added. In the single-wheel traversing-wheel-base type, they are built up to 60 in. swing, 30 ft. between centers.

In measuring roll diameters, it ordinarily suffices to know the actual diameter only approximately, except, of course, when mills require "matched" rolls. It is always necessary, however, to know the magnitude of crown or concavity. Therefore, measuring devices known as "roll calipers" are designed for this purpose only. They usually consist of a yoke on one leg of which is mounted an indicator. By setting the indicator at "0" at the end of the roll and moving to the center, the indicator will register the difference in diameter.

The accompanying illustration shows a typical roll caliper.

In summary, it can be stated generally that many machines designed with as many different characteristics will do satisfactory work. Modern engineering has taken the so-called "mystery" out of roll grinding.

Fabricating Ford Lamps From Rustless Steel

(Concluded from Page 217)

2 in. deep and $4\frac{1}{4}$ in. in diameter. The press turns out 30 shells a minute.

After being washed in a conveyor-type washing machine, the shell is prepared for a severe drawing operation, which consists of forming the hub on the angle hole, by the spot annealing of an area half an inch in diameter around the outside of the hole. The angle hole then is formed on a small press. The shell is polished and buffed on an automatic machine with only a single line of buffing and polishing wheels. The shell is slotted for the window assembly and two screw holes are pierced and stamped.

The rear lamp door is made from a rustless steel disk which is oiled drawn, spun, washed in a conveyor-type machine and polished and buffed on an automatic machine. Head lamps for commercial cars are fabricated from 20 gage, cold-rolled strip steel, after which two coats of black enamel are applied and baked in conveyor-type ovens at 450 deg. Fahr. The lamps are hung on racks for passage through the tanks of enamel and through the ovens. These lamps have rustless steel doors.

Lamp reflectors are made from 0.020 in. brass disks formed by three operations and polished and buffed on an automatic machine. The buffing compound is applied automatically to the buffing wheels by a novel device. Air pressure valves are set so that as the buffing machines are ready to feed down onto the shells, a valve is automatically tripped, turning on the air pressure and pushing the cylinder containing the buffing compound down onto the work for a fraction of a second. A coil spring pulls back the plunger in the cylinder, releasing the air and automatically turning off the pressure.

Reflectors are given a coating of nickel and then one of silver in an automatic plating machine, being carried through the plating processes on overhead conveyors which dip into the various tanks. The plating operations consist of a hot water wash, hot water rinse, immersion in the nickel bath for 20 min. and immersion in the silver bath for 10 min. After being plated, reflectors are color buffed by hand.

To protect workmen from dust, dirt and abrasive material arising from

operation of the automatic polishing and buffing machines and to keep the plant's atmosphere clear and fresh, the air is changed every three or four minutes by means of six blowers run by a 50-hp. motor. Outside the building are six dust collectors which draw the dust by air suction from inside the plant. Each buffing and polishing wheel is connected to this system so that all abrasive material will be drawn into it. As the dust collectors fill with dirt, wagons are driven underneath them and they are emptied.

It is interesting to note that rustless steel stock for head lamps is received from the maker in the form of disks $13\frac{3}{4}$ in. in diameter, each package comprising 600 disks. This results in a considerable saving in transporting scrap back to the steel mill and in shipping unnecessarily bulky flat sheets to the lamp plant. Brass material for lamp reflectors is received in the same form.

The Flat Rock plant is run partially on water power derived from the Huron River, on the banks of which it is situated, two 350-kw. water turbines being installed for this purpose. This water power is supplemented by electric energy transmitted from the Ford power station at the Rouge plant.

Steel Barrel Output Higher in June

WASHINGTON, Aug. 8.—Production of steel barrels rose in June to 641,443 from 427,299 in May, according to data reported to the Bureau of the Census by 27 establishments operating 32 plants. A corresponding increase in shipments is reflected in the June total of 644,983, compared with 425,662 in May. Output of steel barrels in the first half of 1932 totaled 2,695,572, against 3,177,673 in the first half of 1931. Shipments in the first six months of the current year totaling 2,698,384, compare with 3,200,587 in the corresponding period of last year.

Steel Castings Orders Up Slightly in June

WASHINGTON, Aug. 8.—Bookings of commercial steel castings in June aggregated 12,765 tons, or 8.7 per cent of capacity of the 130 principal manufacturers reporting to the Bureau of the Census. This compares with orders in May of 11,342 tons and in June, 1931, of 26,136 tons. Bookings in the first half of the current year were 87,855 tons, compared with 246,541 tons in the corresponding period of 1931. Production in June of 12,839 tons compares with 14,463 tons in the preceding month. Output in the first six months of 1932 amounted to 102,455 tons, contrasted with 279,051 tons in the first half of 1931.